

National Aeronautics and Space Administration

John F. Kennedy Space Center

SHUTTLE PERFORMANCE SURVEILLANCE PLAN

(KSC-KPH-008)

For The

***Space Flight Operations Contract
(SFOC)***

**KSC-KPH-008 Revision B
July 21, 2000**

**Kennedy Space Center
Shuttle Performance Surveillance Plan**

EXECUTIVE SUMMARY

The conversion to a performance based contract required the development of a Surveillance Plan. Under a performance-based contract the government's role has shifted from oversight to insight. In this approach, the contractor assumes more responsibility and greater risk in exchange for more flexibility and less Government direct involvement. This Performance Surveillance Plan was generated to serve as the method by which the government obtains the information needed to effectively assess the contractor's performance. The Space Flight Operations Contract serves as the source for defining the elements of this plan. All surveillance requirements identified are in the SOW (Statement Of Work) or referenced in the SOW. The plan identifies items requiring surveillance, identifies the responsible organizations and references implementation plans stipulating the surveillance tools to be used. Other items identified within the plan include the appropriate reference to the SOW paragraph number and the particular organizational interests. NASA retained functions supported by the contractor are also included in this plan.

The plan is a "living" document that will experience numerous changes in the future. As the Government gains increasing confidence in the contractor's ability to independently perform to the conditions of the contract, the government will modify the plan in order to incorporate less invasive forms of surveillance.

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1.0 INTRODUCTION

1.1 Background

In 1996, the government awarded to United Space Alliance (USA) contract NAS9-20000, the Space Flight Operations Contract (SFOC). This is a performance-based contract, consolidating formerly major operational contracts under a single contract. The overarching goals of the SFOC are to fly safely and to achieve mission success, including schedule, while achieving cost savings. This contract consolidation represents a significant change in NASA philosophy where accountability for operations will shift from NASA to the SFOC Contractor. Although NASA has chosen to minimize their participation in non-research and development areas, NASA personnel will continue to be involved in and to provide an oversight role for research and development activities. Consistent with its overarching goals, NASA will continue to maintain visibility into the Contractor's operation and insight in key performance activities. Further, the management approach of the Contractor must be compatible with NASA's retention of functions deemed inherently Governmental.

SFOC is written to reflect performance-based requirements which emphasize results and minimize how to performance descriptions. The Contractor has responsibility for total performance, including accountability for all subcontracted activities. The performance-based requirements, which reflect NASA's minimum needs, provide exceptional flexibility to the Contractor. However, the SSP will remain NASA-managed. The Contractor shall keep NASA continually informed about all concerns and issues, particularly those related to safety and mission success. It is the Contractor's responsibility to recommend new ideas to successfully meet NASA's overarching goals; it is NASA's role to be involved in and, when appropriate, approve implementation.

Insight of SFOC is centralized within the SSP Office, JSC. SFOC will be administered under the direction of the Manager, Space Shuttle Program, who will serve as the Fee Determination Official. The Program Manager, in concert with the Contracting Officer, will select a single COTR to be located at JSC. The KSC Technical Management Representatives (TMRs) perform audit, surveillance, and other insight functions as well as to manage selected development projects. The Contractor and its subcontractors shall interact with these principal officials in executing contract responsibilities.

1.2 Goal

The surveillance performed on the Space Flight Operations Contract directly supports the Space Shuttle Program (SSP) and the Human Exploration and Development of Space (HEDS) Enterprise. The surveillance activities and performance measures are aligned with the HEDS Enterprise goals as shown below:

- Explore the Space Frontier,
- Expand Scientific Knowledge,
- Enable Humans to Live and Work Permanently in Space,
- Enable the Commercial Development of Space, and

- Share the Experience and Benefits of discovery. ¹

The HEDS Enterprise Strategic Plan amplifies these goals and establishes objectives and strategies for meeting the HEDS Enterprise goals. Critical to the success of the HEDS Enterprise and particularly Goal 3 is the attainment of safe, reliable, low-cost space transportation.

The Space Shuttle Program has undergone significant change over the last 4 years and continues to change. This includes consolidating Shuttle contracts and implementing a performance-based contract which specifies what the government needs and relies upon the contractor to determine how the result (product or service) is to be provided. The Space Flight Operations Contract (SFOC)² has combined several contracts and may result in further consolidation in the future. As stated in the Space Shuttle Program Restructuring Guidelines, The order of precedence of SSP goals is:

- Fly Safely
- Meet Manifest
- Improve Supportability
- Save Costs ³

1.3 Overview

This plan baselines KSC surveillance activities for the SFOC Statement Of Work (SOW)² and describes the process for assessing the contractor's performance. It consists of two distinct parts, integrated at the program level to provide an overall evaluation.

The first part of the performance assessment is associated with the performance-based parts of the SFOC contract. This makes up, by far, the largest portion of the work covered by the SFOC Statement Of Work. NASA will rely on surveillance activities to assess the performance of the SFOC. Each organization supporting either the Ground Operations TMR or the Shuttle Logistics TMR will provide an assessment of the SFOC activities for which they are responsible. Each SOW instruction, Data Requirement (DR) and required service with the associated surveillance tool is contained in Appendix B or within lower level implementation plans. The tools used in this plan are inspection, in-depth observation, sampling, checklists (surveys and audits), Management Information Systems (MIS), and customer feedback. Each tool associated with a statement of work contract item will provide the selection rationale, the frequency of assessment, and the organization responsible for performing the assessment. In summary, the item requiring surveillance will be identified, the tool or tools used to provide surveillance assessment of performance will be identified, and the frequency of assessment defined.

The second part of the performance assessment is for the contractor support of NASA-retained functions as outlined in the Program Guidelines. NASA-retained functions

¹ Human Exploration & Development of Space Strategic Plan, published 2000.

² Space Flight Operations Contract, NAS9-20000 dated September 26, 1996

³ Space Shuttle Program Manager letter MA-96-012 dated April 16, 1996; Enclosure: Space Shuttle Program Restructuring/Streamlining Guidelines dated March 15, 1996.

include out-of-family anomaly resolution for existing systems, design and development of new systems, and NASA Managed Activities (NMA) such as launch, flight operations, landing and recovery operations. These activities have traditionally had NASA in-line involvement in the Contractor's work. This NASA oversight activity will continue. NASA will provide a performance assessment as a result of direct involvement in the SFOC work activity. Although these activities will be identified in this plan, the NASA in-line assessment, in place today, remains unchanged.

For the two-part assessment process described above each organization will have distinct responsibilities to assess performance using prescribed tools in the plan. The results of these surveillance assessments will be integrated as designated by the appropriate Technical Management Representative.

The integration activity will provide an integrated surveillance assessment package. For the Ground Operations TMR, the assessment is available on line at <http://kscingr/metrics.htm>. For the Shuttle Logistics TMR, the assessment is available in the Shuttle Logistics Division's surveillance database. An illustration of the relationship of assessments to the evaluation and the content of the Performance Surveillance Plan is provided in Figure 1-1.

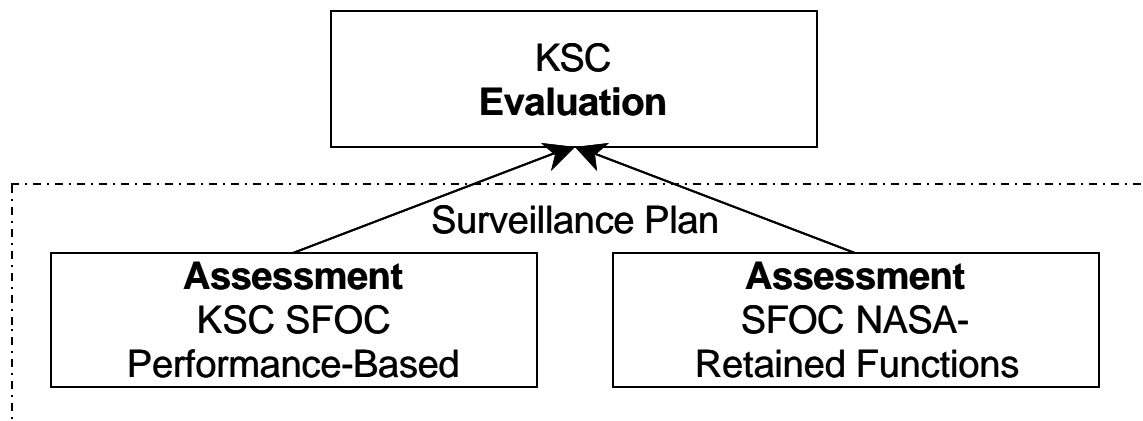


Figure 1-1. Assessment Support to Evaluation

1.4 Definitions

There are several definitions which will be used throughout this document and will be defined here for clarity.

1.4.1 Oversight and Insight

Over the last 5 years, NASA has reduced its workforce transitioning many of the NASA functions to the contractor. In the past, most of NASA's surveillance activity was oversight of the contractor's performance, whereas today, most of the activity is insight into the contractor's performance. Figure 1-2 depicts the relationship of oversight and insight. Oversight is knowledge of contractor performance through controls and/or constraints to the contractor's processes. Insight is knowledge through independent NASA processes and does not constrain the contractor.

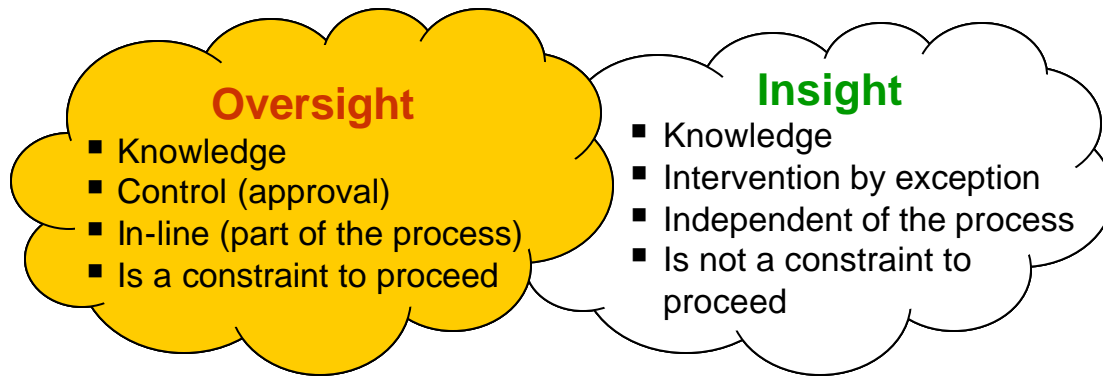


Figure 1-2. Attributes of oversight and insight

1.4.1.1 Insight

Insight is an assurance process that uses product performance requirements and performance metrics to ensure process capability, product quality and end-item effectiveness. Insight relies on gathering a minimum set of product or process data that provides adequate visibility into the integrity of the product or process. The data may be acquired from contractor records, usually in a non-intrusive parallel method.

Insight as applied to NAS9-20000 results in lower levels of Government surveillance and allows the contractor to assume increased responsibility and accountability for the integrity of processes. Insight relies heavily on evaluating planned contract deliverables and existing contractor procedures and working documents.

The Government's goal is to follow an insight-driven surveillance strategy. However, the Government reserves the right to use an oversight or hybrid approach (see below) to monitor questionable areas or areas of poor contractor performance.

1.4.1.2 Oversight

Oversight is an assurance process that uses customer-imposed product specification and process controls, such as MIL-Specifications, MIL Standards and mandatory inspections, to direct the development and production of the product. Oversight is intrusive in that it requires gathering contractor product or process data through on-site, in-series involvement in the process. Oversight entails very detailed monitoring of the process itself. Oversight is an in-line involvement in an activity with review and approval authority implicit to the degree necessary to assure that a process or product's key characteristics are stable and in control.

As applied to NAS9-20000, the Government will limit the use of oversight to those processes for which one or more of the following apply: 1) the Government assumes the liability; 2) the Government has determined that oversight is the only method to mitigate risk; 3) the contractor has limited experience and/or 4) the contractor has not demonstrated acceptable performance.

1.4.2 Review, Assessment and Evaluation

Another set of terms defined here and used throughout the document is review, assessment and evaluation. Review denotes the activity to become familiar with the data, e.g. a metric, without providing written description or interpretation of the data or its significance. Assessment is the objective and factual description of what has occurred. Assessments are backed up by evidence, e.g.; metrics. Evaluation is the subjective and sometimes anecdotal description of what has occurred and often provides judgment and action to be taken. Evaluations are most effective when assessments provide factual and objective description of events and subject matter experts judge the events and recommend follow on activity, if appropriate.

1.4.3 Out-of-Family/In-Family

Other terms used throughout this document are Out-of-Family and In-Family. In general, any operation or performance outside expected range or which has not been previously been experienced is out-of-family. For a more detailed description and examples see section 3.7.2.

2.0 REQUIREMENTS

Federal regulations require that the Contracting Officer's Technical Representative prepare and implement a surveillance plan for the SFOC.⁴ The Contracting Officer and the COTR have determined that each Technical Management Representative shall prepare a surveillance plan for their delegated areas. This plan covers the areas delegated to KSC, Ground Operations and Shuttle Logistics.

2.1 Objectives

This plan's objective is to provide accurate assessments of the contractor's shuttle processing and shuttle logistics activities. These assessments ensure receipt of the quantity and kinds of products and levels of services required by the contract.⁵ Surveillance provides government assessment of contractor plans, schedules, controls, and processes.⁴ The plan will include but not be limited to, identification of how the contractor will be assessed against the metrics identified in attachment J-1-B of the NAS9-20000 contract.² The accuracy of contractor reporting (reports, performance metrics, or insight metrics) will be verified either through continuous surveillance of activities or through the review of each report.⁴ Where contractor reporting does not provide sufficient insight, the government will initiate independent surveillance assessments of contractor activities.

Assessment activities include the observation of contractor activity, the collection of data, processing this data into information, the analysis of this information to determine what has occurred and publication of the assessment products.

Separate evaluation processes will use the surveillance assessments as inputs along with the expertise of engineering, operations and management to judge the level of contractor performance in meeting requirements. The award fee and Certification of Flight Readiness (CoFR) are examples of evaluation processes. (NOTE: The evaluation process is not part of the assessment process. It is a separate process and the next step in the overall NASA management process.)

These assessments will also be used in formulating guidance to the contractor for future activities (such as areas of emphasis).

Surveillance criteria identify aspects of requirement(s) that must be present for satisfactory contractor performance. Assessment activities and products will provide meaningful input into the various evaluation processes. Figure 2-1 illustrates the relationships between Assessment and Evaluation processes where the needs of evaluation (top arrow in Figure 2-1) are used to set up the assessments which in turn provide products (bottom arrow in Figure 2-1) to support the evaluation.

⁴ FAC 90-32 dated October 1, 1995

⁵ NASA FAR Supplement 89-14 dated March 31, 1994

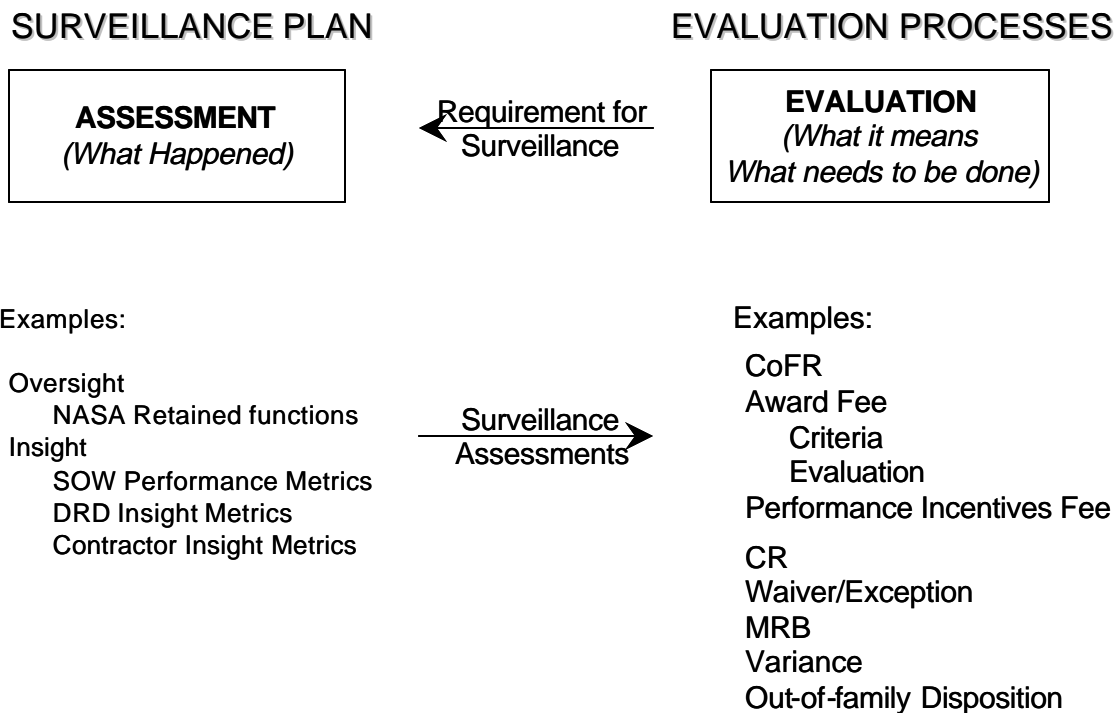


Figure 2- 1. Assessment Relationship to Evaluation

2.2 KSC Surveillance Assessment Responsibilities

The Johnson Space Center (JSC) contracting officer for the SFOC has delegated to KSC Technical Management Representative (TMR) responsibilities for Ground Operations and Shuttle Logistics. The responsibilities include development and implementation of a surveillance plan for the assessment of specific SFOC activities at KSC (See Appendix A). In the case of the Ground Operations⁶ TMR, the contracting officer has delegated additional responsibility to provide for government assessment of specific activities occurring at KSC. These TMR delegations are provided in Table 2-1.

⁶ Contracting Officer's Technical Management Representative Delegation for Space Flight Operations Contract, NAS 9-2000, letter delegating Ground Operations TMR responsibilities, dated December 01, 1999.

SOW Section	KSC TMR Responsibilities	
	X Full Responsibility GO Responsible for Ground Operations Only MI Management Insight	
	KSC Logistics ⁷	KSC Ground Operations ⁶
1.1		MI
1.2.11		MI
1.3		MI
1.4 (General Processing Requirements)		X
1.4 (General Logistics Requirements)	X	
1.4.1.1		MI
1.4.1.2	X	
1.4.1.3		X
1.4.1.4		X
1.4.1.5.2		MI
1.4.1.5.3		GO & MI
1.4.1.5.4		MI
1.4.2.1		X
1.4.2.4	X	
1.4.2.6		X
1.4.2.8		X
1.4.2.10		GO
1.4.3.1		MI
1.4.4.1		X
1.4.4.2	X	MI
1.4.4.4		X
1.4.4.5		GO
1.4.4.7		MI
1.4.5.1		X
1.4.5.2	X	
1.4.5.3		X
1.4.5.5		GO
1.4.5.7		MI
1.4.6.1		X
1.4.6.2	X	
1.4.6.3		X
1.4.6.5		GO
1.4.6.7		MI
1.4.9.1		MI
1.4.9.4		MI
1.5.		X
1.5.1		X
1.5.2		X
1.5.3		X
1.5.4		X
1.5.5		GO
1.5.5.1		X
1.5.5.2		GO
1.5.5.3		GO
1.5.5.4	X	
1.7.1.1		X
1.7.1.2		X
1.7.2.5		MI

⁷ Contracting Officer's Technical Management Representative Delegation for Space Flight Operations Contract, NAS9-2000, letter delegating Integrated Logistics TMR responsibilities, dated 8/10/98

2.3 Award Fee Evaluation Processes

The award fee evaluation flow charts, KDP-P-1696 and KDP-P-1754 are under configuration control on KSC's Business World and are electronically available at web site: <http://businessworld.nasa.gov/>. These flow charts were generated as part of the KSC effort to satisfy the ISO 9001 certification requirements.

2.4 Change Control

This Performance Surveillance Plan will change. Change control of this document is the responsibility of KSC management. As a minimum the document will be updated once every 2 years or more frequently if required. As changes occur, they will be forwarded to the Contracting Officer's Technical Representative for incorporation into the overall program surveillance plan. As each KSC TMR determines the need for a change in surveillance activities, the changes will be reflected in this document and the appropriate lower level documents. For example, during the course of implementation, KSC may determine a need to change from an audit to a sampling surveillance tool as the way to provide insight. Short-term temporary changes of the surveillance tool will not drive a change to the surveillance plan. For example, sampling may be utilized to check the validity of customer feedback. After validation of the complaints, the assessment tool may revert back to the original customer feedback tool.

3.0 APPROACH

3.1 Planning

The Performance Surveillance Plan has been constructed to meet applicable Government⁴, Agency⁵ and Program Objectives⁸.

3.1.1 Transition

Prior to the transition from government oversight of the SFOC performance to government insight, many NASA responsibilities were transitioned from NASA to SFOC (based upon a jointly developed NASA/USA Transition Plan⁹). At KSC, 305 tasks were transitioned from June of 1996 through July of 1998. Although the large-scale transition is complete, we expect transitions to occur in the future, transitioning current government tasks to the SFOC or current SFOC tasks to NASA.

The TMR establishes the insight requirements for a technical work area. In this role, the TMR plans and implements the required performance surveillance activities for that surveillance area. The TMR is responsible for managing the transition of existing related contracts into SFOC. In this capacity, the TMR maintains the authority to direct in-scope changes to operating policies and principles. The TMR recommends to the Contracting

Table 2- 1. SFOC SOW Delegated TMR
Responsibilities to KSC

Officer's Technical Representative and Program Manager the appropriate phasing of

⁸ SFOC Contracting Officer's Technical Representative Briefing, SFOC Surveillance

⁹ Space Flight Operations Contract (SFOC) Program Management Plan, Rev. A dated July 30, 1996

NASA vs. United Space Alliance involvement in boards and panels, requirements documentation, and the commit-to-flight. Changes to the surveillance responsibilities for each TMR will be directed through the COTR via a TMR responsibilities letter.

3.2 KSC NASA Organizations Participating in SFOC Surveillance

The Shuttle Processing Directorate and the Spaceport Services Directorate are the primary organizations involved in surveillance of the SFOC at KSC. In the surveillance activity, the Technical Management Representatives (refer to Table 1) provide the overall management and integration of the assessment activities and products.

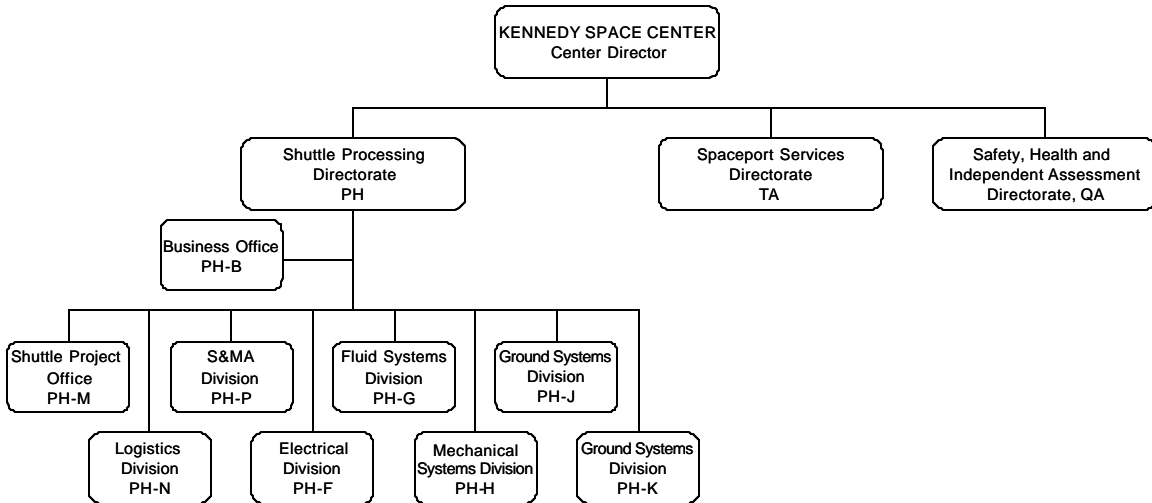


Figure 3- 1. KSC Organizations Participating in SFOC Surveillance

3.3 Government Assurance

The government surveillance activities include assessments of the contractors plans, procedures, actual work activity, and the products and services provided. Figure 3-2 provides a framework for visualizing the government and contractor responsibilities. The chart was generated as part of the SFOC Source Evaluation Board activities. The chart identifies that the items listed below the line are the responsibility of the contractor. Generally, NASA achieves insight for the contractor-accountable items through surveillance activities (See Appendix A for discussion of surveillance tools) to assure the contractor is meeting the requirements.

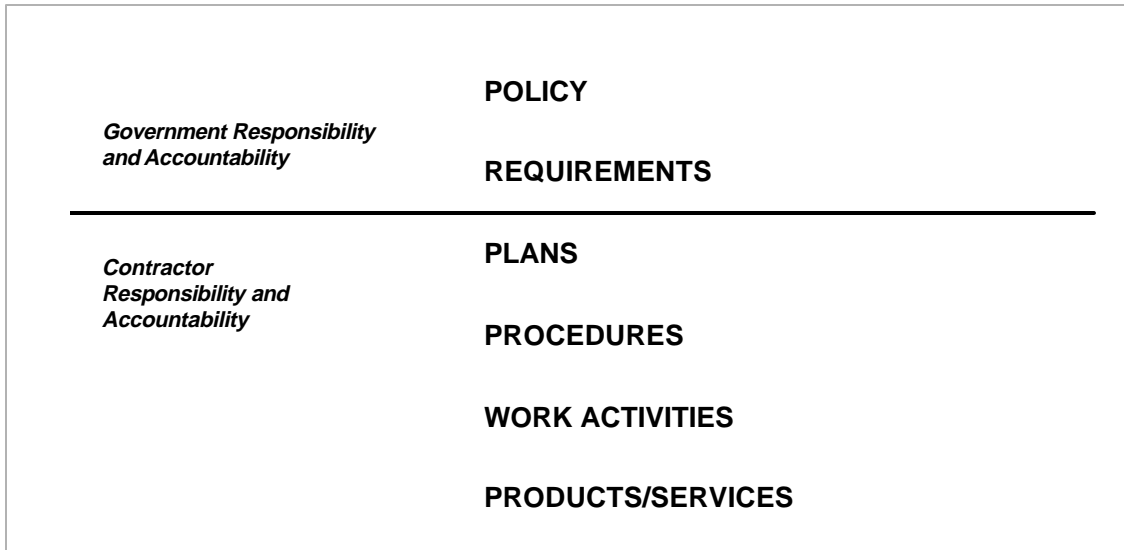


Figure 3- 2. Government Assurance Model for Surveillance of SFOC

3.4 NASA Surveillance Data Flow

The KSC assessments of contractor performance will be based upon information provided by the contractor plus data derived from observations made by the NASA workforce. These assessments were divided into the following categories:

- USA performance demonstration products and USA data from which those products were generated. USA provides several products demonstrating performance of contract requirements. These products and data from which they were derived will be validated and analyzed as part of the KSC NASA surveillance assessment of USA performance.
- The NASA workforce will make observations of contractor work activities, record findings, and analyze this data as part of the NASA assessment of contractor performance.

These two data streams and derived products will be assessed and integrated by each TMR for the completion form and NASA retained activities shown in Figure 1 -1. Figure 3-3 illustrates the data flow into the assessment activity.

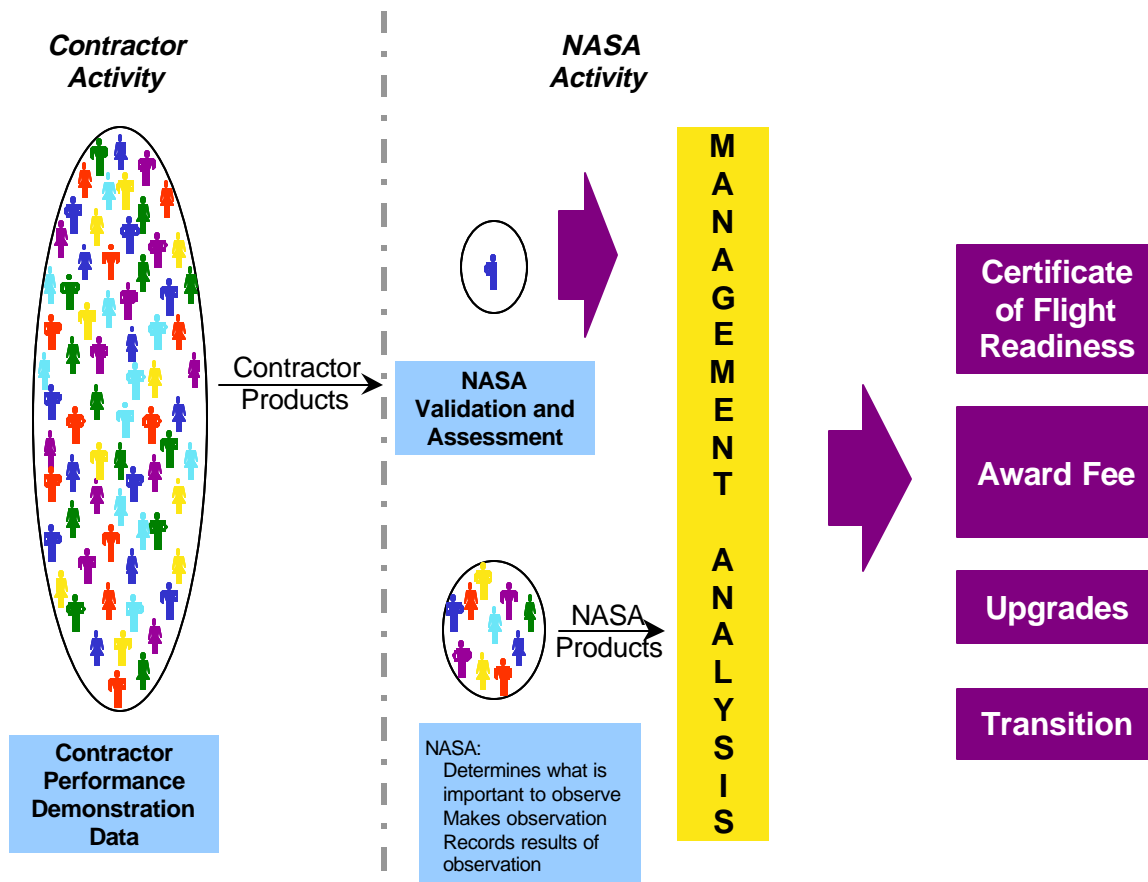


Figure 3- 3. NASA Surveillance Data Flow

3.5 Contractor Performance Demonstration Products

The contractor demonstrates performance by providing metrics in their Performance Measurement System (PMS) and by generating products as required by the DRDs (Data Requirements Description). The PMS contains metrics as required by the SOW plus other insight metrics selected by the contractor to demonstrate compliance to contract work content. Using the requirements analysis, the SOW requirements were mapped into the SOW metrics and the DRDs to determine which SOW requirements would be satisfied when NASA validated and assessed these products. The mapping and partnering with USA were used to develop the set of contract requirements provided in Appendix B for Ground Operations and in the Surveillance Implementation Plan for Shuttle Logistics. Requirements not mapped to PMS or DRDs were coordinated with the contractor to identify additional contractor information systems which were used in the NASA surveillance activities. The list of contractor information systems used in NASA surveillance is provided in Table 3-1. Any requirements not covered by contractor information systems were included in the NASA insight of SFOC work activity.

Automated Line Replaceable Unit Tracking System (ALRUTS)	KSC Inventory Management System (KIMS)
Automated Support Requirements System (ASRS)	Launch Processing System Software Development Network (LSDN)
Automated Work Processing System (AWPS)	Logistics Inventory Management System (LIMS)
Central Data System (CDS)	Mission Requirements Control System (MRCS)
Command Control and Monitor System (CCMS)	Operation and Maintenance Instruction Document System (OMID)
Communications Directorate Data Acquisition and Management System (CD/DAMS)	Operational Maintenance Requirements and Specifications Document (OMRSD)
Computer-Aided Planning and Scheduling System (CAPSS)	Repeatable Maintenance Recall System (RMRS)
Configuration Management Data System (CMDMS)	Performance Measurement System (PMS)
Engineering Drawings/Data Access and Management System (EDAMS)	Practically Everything About Line Replaceable Units (PEARL)
Facility Operational Requirements System (FORS)	Problem Reporting And Corrective Action System (PRACA)
Financial Measurement System (FMS)	Record and Playback System (RPS)
First Time Quality (FTQ)	Shop Floor Control and Data Collection Systems (SFC/DC)
First Time Safety (FTS)	Shuttle Connector Analysis Network (SCAN)
Flow Automation Systems Tracking (FAST)	Software Configuration Management System (SCMS)
Ground Processing Scheduling System (GPSS)	Support Plan Process System (SPPS)
Integrated Operations System (IOS)	Training and Certification Recording System (TCRS)
Integrated Work Control System (IWCS)	Peoplesoft

Table 3- 1. USA Information Systems Used in KSC Surveillance

3.5.1 NASA Surveillance Process for Contractor Metrics

The initial NASA activity will verify the contractor metric through validation of the data upon which the metric is built. Then there will be a determination that the metric is reflective of the data in the data management information system. Once the validation has been performed, NASA will provide an assessment which includes the following:

- a. Value of the metric
- b. Metric limits (if applicable)
- c. Significant trends (capability and stability)
- d. Error categories (what happened)
- e. Error sources (what caused the metric to look the way it does).

These assessments can be displayed grouped by organization to enhance their utility in CoFR and Award Fee evaluation processes. An example assessment format, containing all the elements of an ideal assessment of a contractor metric, is provided in Figure 3-4.

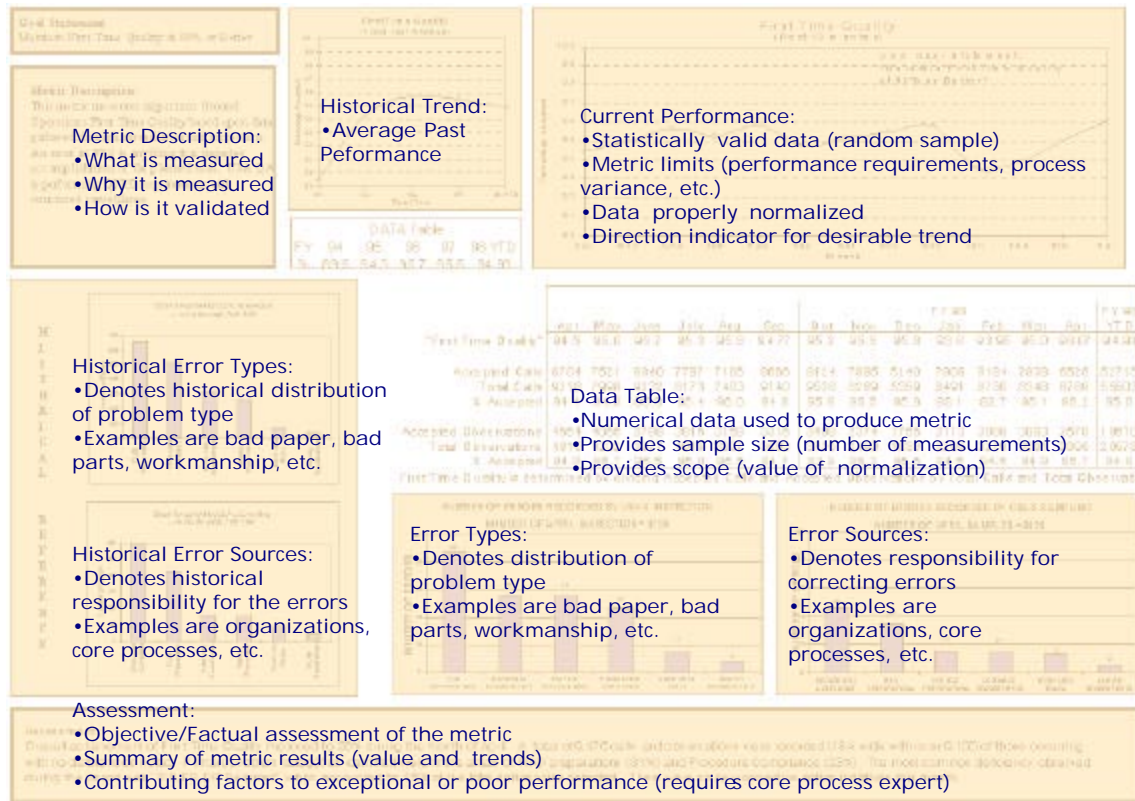


Figure 3- 4. Sample Format of a NASA Assessment of SFOC Metric

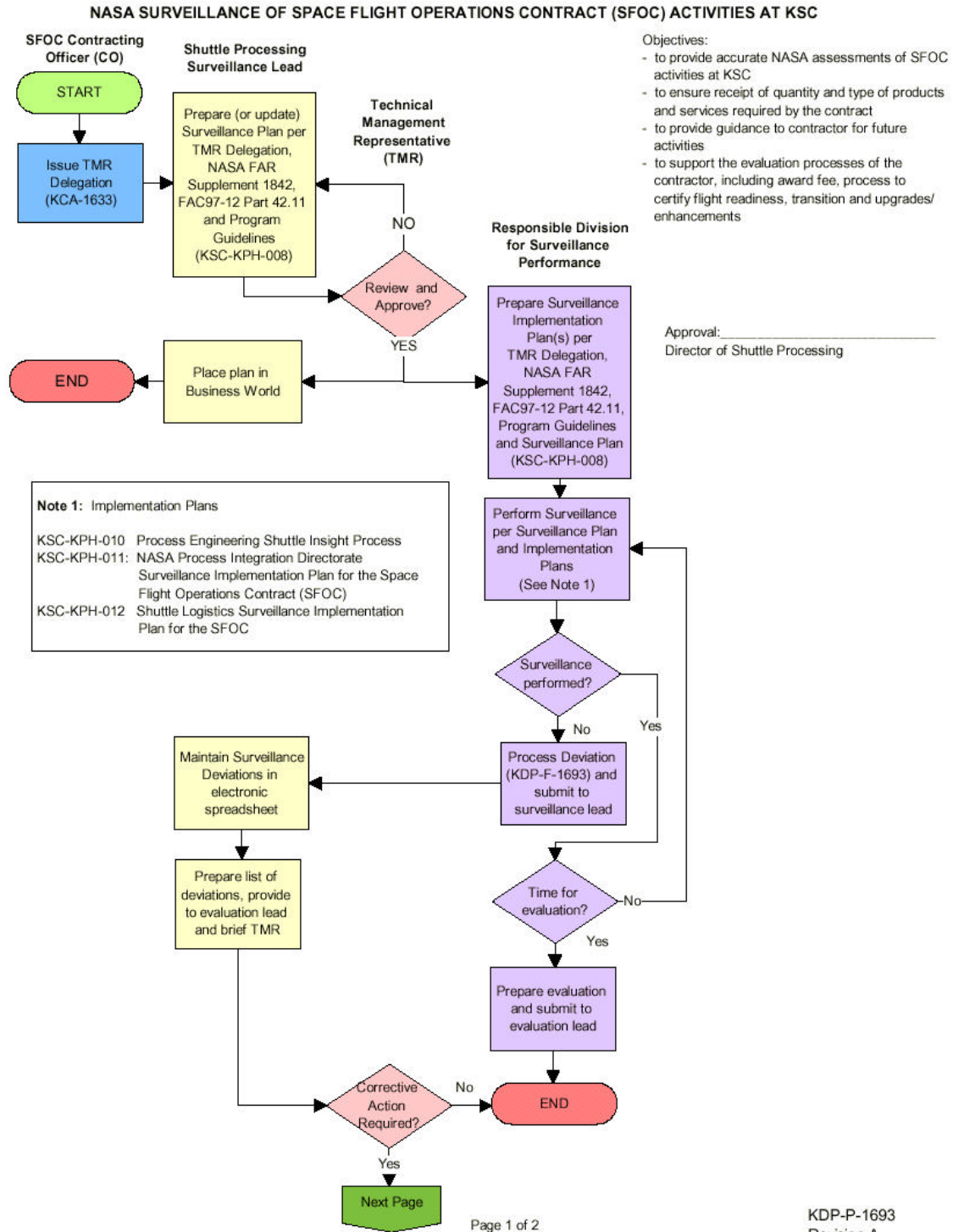
3.5.2 NASA Surveillance Process for Other Contractor Performance Demonstration Products (e.g., DRDs, Procedures, or Plans)

NASA will assess these products through review and approval (inspection) of Type 1 DRDs, and through the review of other products.

3.6 NASA Surveillance of SFOC Work Activity

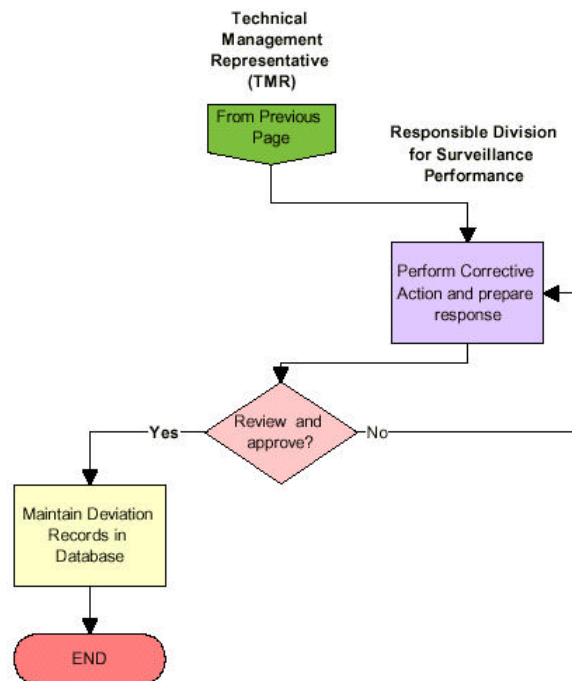
In addition to the assessment activities associated with contractor performance demonstration products. NASA surveillance of work activity will be performed where the contractor metrics assessments do not provide sufficient NASA insight to contractor performance. These activities will provide a check and balance of contractor activities and provide data to validate contractor generated metrics. They will be an essential part of the NASA overall assessment of contractor performance. These assessments will be based on criteria satisfying the KSC organization's interests for the contractor performance requirements. The process, documenting the surveillance activities used at KSC and the relevant interfaces, is contained in a surveillance flow chart which is under configuration and posted on KSC's Business World. You can access it via the following web site: http://businessworld.ksc.nasa.gov/businessworld/html/ksc_docproc.html. This

flow chart was generated as part of the KSC effort to satisfy the ISO 9001 certification requirements. The following flow chart has been extracted from the web site for illustration purposes only. Prior to use, obtain the current version of the official flow chart via the web site provided above. Figure 3-5 illustrates the process used at KSC for surveillance of SFOC contractor activities.



RELEASED - Printed documents may be obsolete; validate prior to use.

Figure 3- 5. NASA KSC Surveillance Process for SFOC (continued on next page)



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KDP-P-1693
Revision A

Figure 3-5a NASA KSC Surveillance Process for SFOC (continued)

3.7 NASA Surveillance Assessment Product Description

The format of the surveillance assessments are determined by the surveillance tools selected. Appendix A provides a discussion of KSC surveillance tools and includes an illustration of the resulting displays. Once the work activity has been observed and the results recorded, the appropriate display(s) are generated. NASA developed metric assessments may include the elements identified in Figure 3-4 (Each KSC TMR may modify the format to be used for their respective surveillance products). Although a formal validation, is not normally included, the metric generation process must be auditable to meet program requirements.

3.8 SFOC Support of NASA Retained Functions

KSC NASA has retained responsibility for several functions as identified in the program guidelines. These functions are discussed in the SFOC Management Plan, Section 7.2.2.1.

3.8.1 KSC NASA Managed Activities

These include but are not limited to launch execution, landing/recovery execution, project management of development activities and the manifest. Contractor activity in support of the NASA retained functions are contained within the responsibilities of the Ground Operations TMR. Contractor performance assessment is based upon contractor

performance demonstration products and/or NASA surveillance of those processes or sub-processes under the contractor's control.

3.8.2 Out-Of-Family Activities

Approval of contractor activities outside the SFOC experience base is retained by NASA as identified in paragraph 1.1.1.4 of the SFOC SOW. In general, any operation or performance outside expected range or which has not been previously been experienced is out-of-family. Any activity or condition not well understood and expressly defined as in-family is out-of-family. (It should be noted that everything that represents an increase in -of-family whereas there are may be circumstances that fall within the out-of-family definition that do not represent an increa

During the transition of activities from NASA to SFOC, guidelines for the transition activity were generated by the KSC shuttle Transition Working Group and approved by the Transition Management Review Team. Using the guidelines, the contractor is responsible for making the determination of what is considered to be out-of-family. The following guidelines were approved on June 25, 1997¹⁰ and in August 1997, the Shuttle program consolidated all definitions of Out-of-Family¹¹ into NSTS-08126, the Space Shuttle Problem and Corrective Reporting System Requirements Document.

IN-FAMILY

The following items are considered to be in-family and therefore the government will transition out (no longer approve) of the approval process for these items:

1. Resolutions to problems for Communications, Facilities and LPS systems that are neither critical nor sensitive as listed in TR 1287.
2. In addition, the following anomaly dispositions on flight, ground systems and software systems are defined as in-family:
 - ◇ Within the SFOC experience base
 - ◇ Within established procedures
 - ◇ Return to print
 - ◇ Anomalies that can be corrected with standard repairs or are within fair wear and tear allowances
 - ◇ Within expected performance ranges
 - ◇ Within test or operational history
 - ◇ Maintains life expectancy

OUT-OF-FAMILY

The following items are considered to be out-of-family and therefore the government will continue to approve dispositions, subsequent to the out-of-family determination, for these items.

Ground Operations:

¹⁰ In-family/Out-of-Family Guidelines; KSC Transition Directive Number 013, dated June 25, 1997

¹¹ NSTS 08126 Space Shuttle Problem and Corrective Reporting System Requirements Document, August 1997

1. Any out of configuration drawing or specification not returned to print::
 - ◇ MRB anomalies
 - ◇ OMRSD waivers/exceptions
 - ◇ Unexplained anomalies
 - ◇ EO to follow
2. Adverse trend or data outside the SFOC experience base.
3. Changes to critical processes
 - ◇ Affects critical hardware manufacture, modification, or repair
 - ◇ Affects hazard controls
 - ◇ Affects CIL retention rationale
 - ◇ New procedure/requirements outside the SFOC experience base for performance
4. Issues or actions involving flight hardware, ground support equipment, facilities, or other support equipment that required emergency action response by firefighters, EMTs (Emergency Management Team), security Hazardous Material team, or environmental health professionals.
5. Issues or actions requiring contingency support or incident/accident investigation initiation.
6. Space Shuttle Program issues or decisions that may affect the SFOC's ability to meet accepted major milestones.

Shuttle Logistics:

The Shuttle Logistics Out-of-Family logistics issues are defined in KSC-KPH-012, Shuttle Logistics Surveillance Implementation Plan for the Space Flight Operations Contract (SFOC). Examples of the type of activities included in Shuttle Logistics Out-of-Family activities are: 1) Transfer of Logistics responsibilities to the KSC Shuttle Logistics TMR and 2) Hardware lifetime/life cycle buys.

3.9 Management Planning Activity

In addition to validating the outputs of the surveillance team, management determined the organizational responsibilities for the assessments and management implementation methodology (For an illustration of the management activity fitted into the planning process, see Appendix A, Figure A-2). The Director of Shuttle Processing, the Ground Operations TMR and the Shuttle Logistics TMR determined:

- a. Organizational implementation responsibilities for both primary and support assessment activities.
- b. Assessment integration methodology
- c. Implementation process within each directorate and across primary directorates.

These determinations are reflected in the responsibility section (see Section 4) of this plan.

4.0 NASA ASSESSMENT RESPONSIBILITIES

4.1 Responsibilities for SFOC

The KSC NASA organizations participating in SFOC surveillance activities were identified in Figure 3-1 of this plan. The organizational responsibilities are specified in Appendix B by SOW section.

4.2 SFOC Performance Demonstration Products Assessment

The following tables designate the NASA organizations having primary responsibility for the assessment of the SFOC performance demonstration products. The frequency of the assessments are provided in section 4.4 of this plan. The first column on the left of each table identifies the contractor product. The contract content related to that product is provided in Appendix B. The second column is the title of the product, the third column identifies the NASA organization having primary responsibility for assessing the product. The fourth column relates KSC management's designation that the product will be assessed as part of the NASA CoFR endorsement process, and the fifth column identifies the contractor products that will be assessed as part of the award fee process (includes the SOW metrics plus other contractor metrics the OPR decides need assessment for every award fee period). Other products (including other contractor metrics) may be assessed as the organizations determine the need to support the evaluation process.

DRD Number	DRD Title	Product OPR	CoFR	Award Fee
1.1.1.1-j	Shuttle Ground Processing Plans/Instructions	PH-B		✓
1.1.2.2-b	Performance Measurement System Reports (Ops)	PH-B		✓
1.1.7-b	Integrated Ground and Flight Operations Schedules	PH-M	✓	✓
1.1.7-c	KSC Schedule and Status and Summary (Gray Book)	PH-M		✓
1.4-a	KSC Work Authorization Document (Category 1) Development & Maintenance Plan	PH-M		✓
1.4-c	Logistics Performance Report	PH-N		✓
1.4-d	Government Furnished Material (GFM) and Propellants Requirements Forecast	PH-N		✓
1.4-e	Loss of Capabilities & Corrective Action Report	PH-N		✓
1.5.1.2	Operations and Contamination Control Plan for Integrated Processing at KSC	PH-M	✓	✓
1.5.2.1	KSC Ground Launch Sequencer Configuration Plan	PH-M	✓	✓
1.5.2.3	KSC Launch Team Certification Plan	PH-M	✓	✓
1.5.4.1	KSC NSTS Salvage Plan	PH-M	✓	✓
1.5.4.1	KSC Offsite Operations Plan	PH-M	✓	✓
1.5.4.1	Convoy Operations Plan	PH-M	✓	✓
1.5.5.3	Notification of Modifications to KSC Configured Systems and Equipment Report	PH-B		✓
1.5.5.4.3-a	Training/Certification Plan and Scheduled Report	PH-N		✓

Table 4- 1. DRD Assessment and Evaluation Responsibility

PMS Number	SOW Section	PMS Title	Product OPR	CoFR	Award Fee
A-GO-001	1.4.1.3	Verify Orbiter Launch Readiness	PH-M	✓	✓
A-GO-002	1.5	Procedures Are Available to Support Operations	PH-M	✓	✓
A-GO-003	1.5	Provide Accurate Integrated Test Schedules	PH-M	✓	✓
A-GO-004	1.5.2.4	USA is Ready to Start Launch Countdown (LCD)	PH-M	✓	✓
A-GO-005	1.5.5.1	Provide Operational Services to Non-SFOC Users	PH-J		✓
A-GO-006	1.5.5.2	Maintain Systems, Software, Firmware, Facilities and Equipment	PH-J	✓	✓
A-GO-007	1.5.5.3	Document Contractor Generated Changes	PH-J	✓	✓
A-GO-008	1.5.5.3	Configuration Engineering Documentation & S/W Code Released with Minimal Errors	PH-J	✓	✓
A-GO-009	1.5.5.3	Engineering Documentation Released Complete and with Minimal Errors	PH-J		✓
A-GO-010	1.5.5.3	Document CCMS Changes to Configured Facilities, System and Equipment	PH-J		✓
A-IL-001	1.5.5.4	Logistics Parts & Material Provisioning	PH-N		✓
A-IL-002	1.5.5.4	Logistics Hardware Suitability	PH-N	✓	✓
A-IL-003	1.5.5.4	Orbiter Logistics Cannibalization	PH-N		✓
A-IL-004	1.4.1.2	Orbiter Logistics Hardware Goodness Report	PH-N	✓	✓
A-IL-005	1.4.1.2	Orbiter Logistics TPS Hardware Timeliness	PH-N		✓
A-IL-007	1.5.5.4	Logistics GSE Cannibalizations	PH-N		✓
A-IL-008	1.4.1.2	Orbiter Repairable (LRU) Fill Rate On-Time	PH-N		✓
A-IL-009	1.4.1.2	Orbiter Non-Repairable (MSP) Hardware Fill Rate On-Time	PH-N		✓
A-IL-010	1.4 & 1.5.5.4.2	Ground Operations Hazardous Waste Reduction	TA-D2		✓

Table 4- 2. SOW Assessment and Evaluation Responsibility

4.3 KSC NASA Assessment Frequency

The time between assessments are guided by program requirements and/or the needs for assessment updates for the various evaluation processes.

4.3.1 CoFR Endorsement

Assessments or assessment updates associated with the CoFR evaluation process must be performed at least once each flow.

4.3.2 Award Fee

In the TMR delegation letter, the program requires that the contract SOW metrics be assessed. The KSC NASA assessments of these metrics will be updated, as a minimum, prior to the final award fee evaluation during any award fee period. Assessments of other metrics (contractor or NASA generated metrics) to support the award fee process will be updated as required.

Appendix A: Surveillance Tools

NASA KSC has chosen six principal tools to use for surveillance of the Space Flight Operations Contractor. This list of tools is not exhaustive. If it becomes evident that additional tools are necessary and available, they may be added to the list. These tools are discussed in some detail in this appendix. These tools have unique attributes and characteristics that should be considered when selecting them for use. Some of the factors to be considered during tool selection include criticality of the requirement being monitored, the consequences of poor performance, the desired level of penetration, the NASA resources available and the need to monitor process stability and capability. The use of any one of the tools to observe the process and record results permits the development of a metric(s) (different metrics for different tools) which can be assessed to determine how the contractor is performing in the process being measured.

The surveillance team used knowledge of the processes to determine which process elements were most important to successfully satisfy the requirements. These identified elements would be used when observing SFOC work activity. Once the observations are made and the results recorded, metric(s) can be generated. The general approach to metrics in Figure A-1 uses knowledge of the important parts of a process.

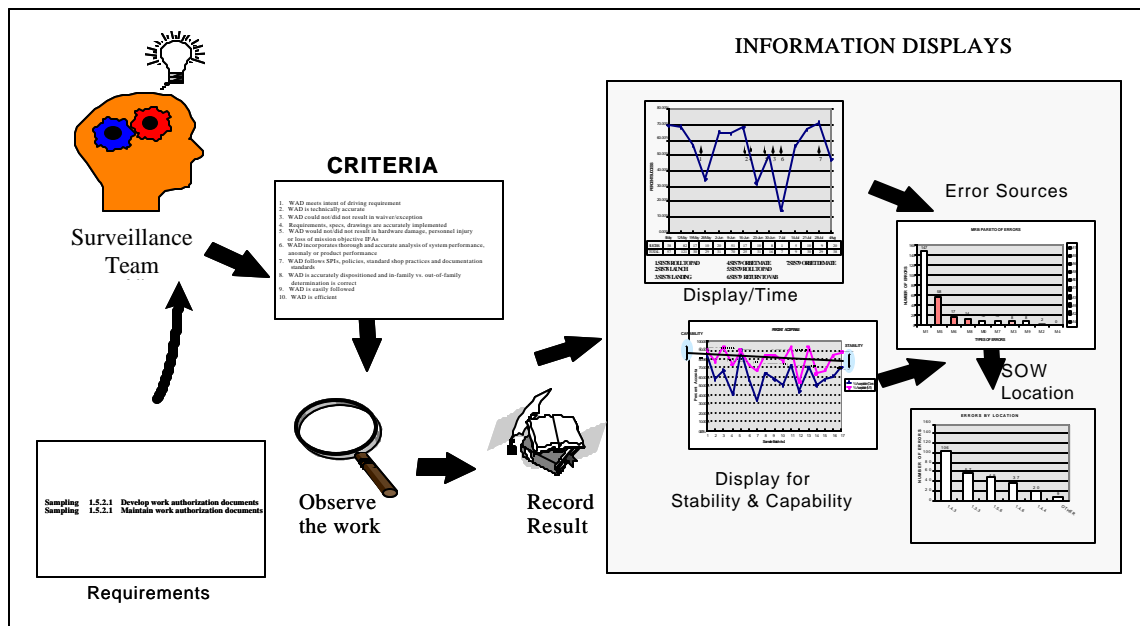


Figure A-1. General Process for Metric Development

If metrics are used in the assessment of performance within specific shuttle processing flows, the metrics need to be computed at designated processing points consistently. With historical computations of process stability and capability, typical performance for a given increment of work can be established. In addition, consistent use of designated measurement points in processing allows managers to compare performance of processes and gather insight into their inter-relationships. For example, KSC shuttle processing may be illustrated as shown in Figure A-2. For the purpose of computing contractor performance, the Figure A-2 flow begins with the Launch Site Flow Review

and ends with call to stations for launch countdown. In this example, the incremental metric computation points are labeled K-1 through K-11. Most of the measurement points are evident; however, the points K-10 and K-11 need some explanation. The K-10 measurement point is to support the LRR (Launch Readiness Review), and K-11 covers the increment of launch pad vertical work from the LRR to the call to stations.

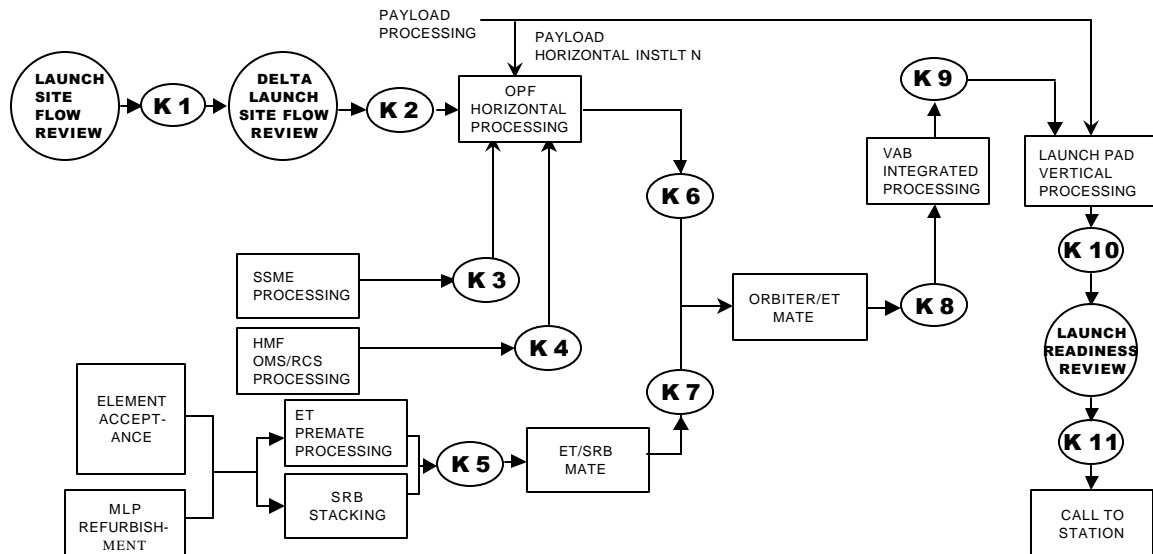


Figure A-2 Shuttle Processing Measurement Points

The computation of the metric for any measurement point includes all work back to the previous metric computation point. For example, the ET/SRB Mate activities would always be measured at K-7 in Figure A-2 and would include all effort between K-7 back to K-6. Using this convention, it is possible to compute process stability, capability, error types (e.g., workmanship, human factors), error sources (e.g., structures, tile) within a flow. Additionally, it becomes possible to compute typical within flow stability, capability, error types, error sources and within flow and multi-flow trends. An example of this kind of metric is provided in Figure A-3.

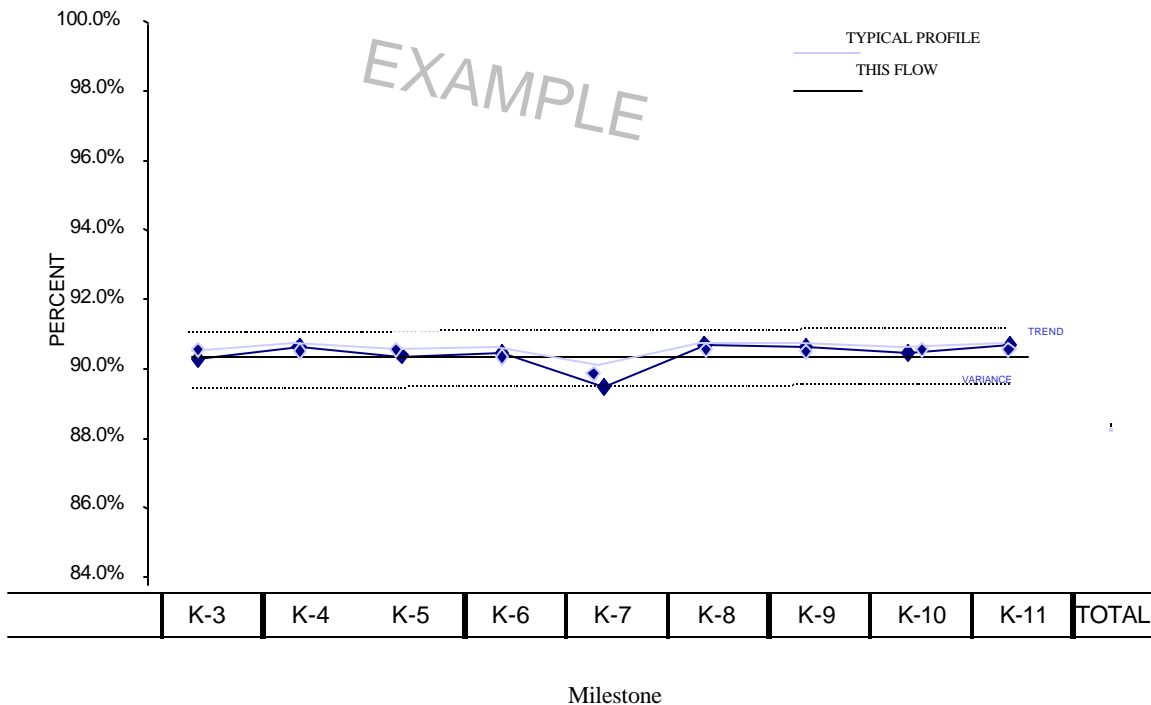


Figure A-3 Process Measurement Point Flow Metric

Examples of specific displays using the different tools are provided as part of the discussion of that tool.

A.1 Customer feedback

The tool represents a conscious decision by the government not to perform any active insight to assure that a contractual requirement is met. Its primary purpose is to notify the government of a problem which may warrant further assessment action. This action may be to guide problem resolution or corrective actions. It may also be as an indicator to increase government surveillance through use of a different insight method. Customer feedback is a reactive tool which should not be used as the only method of surveillance for critical processes and activities. Customer feedback should be validated by the organization having the primary assessment responsibility.

Examples of customer feedback includes:

- IFAs and post flight anomalies due to the contractor s performance
- Feedback from other TMRs
- Feedback from Payload customers

A.1.1 Tool Selection Factors:

Factors to consider when selecting the Customer feedback tool include:

- a. Customer feedback is a reactive tool and does not allow real-time insight into contractor performance
- b. The customer feedback tool is seldom used to reject a service or product

- c. The customer feedback tool is seldom used to deduct money from the contractor
- d. The customer feedback tool should not be used for critical requirements where the consequences of failure are non-recoverable
- e. The customer feedback tool is less resource intensive for the government

A.1.2 Implementation Considerations

The following considerations may be helpful during implementation planning:

- a. Potential customers should be identified
- b. Potential types of customer feedback should be identified
- c. A method of processing customer feedback must be established, including receiving, logging, validating, tracking and disposition methods, etc.

A.1.3 Example: Detailed example of Customer feedback tool application

To be developed.

Organization:

SOW Paragraph:

Action Text:

Interest:

A.2 Management Information Systems (MIS) (2)

This is the surveillance tool where insight into contractor performance is achieved through assessment of contractor or government-generated data. In most cases, the contractor will be generating data in order to manage his processes. This data can be in electronic or hard copy media. Use of this contractor-generated data by the government represents an efficient means of gaining insight. In some cases the government may also be required to generate its own data to be used to evaluate the contractor. For the government to accept and rely on MIS, the data and output of the MIS must be validated by the government to assure that it is factual and accurately reflects the contractor's performance. This validation should occur until the Government achieves confidence in contractor generated data. Re-evaluation of data should occur on a scheduled basis.

Examples of contractor-generated MIS include:

- Problem Reporting And Corrective Action data
- Shop Floor Control/Data Collection System data
- Work Authorization Document data, etc.
- Maintenance Trend Analysis Report (MTAR)

A.2.1 Tool Selection Factors

Factors to consider when selecting the MIS tool include:

- a. The Government must be confident that the contractor's MIS input data must be validated and output information must accurately reflect contractor performance
- b. Data and information are available or could be readily available to support timely government assessments of contractor performance
- c. Data and information are complete and consistent
- d. Data and information are clearly defined

- e. Information is in a useable form

A.2.2 Implementation Considerations

The following considerations may be helpful during implementation planning:

- a. Specific MIS must be identified and mapped to the SOW requirement that will be demonstrated through its use
- b. Data manipulation techniques used to produce the resulting information must be defined and clearly understood
- c. Data included and/or excluded in the analysis which produces the resulting information must be identified
- d. Access to contractor-generated data by the government must be arranged
- e. Training of the government in retrieving contractor maintained data use must be provided by the contractor.

A.2.3 Example: Detailed example of MIS tool application

Organization: LO

SOW Paragraph: 1.5.5.4.1

Action Text: Monitor hardware zero balances

Interest: Ensure that the hardware zero balances are properly reported and managed.

The contractor should be striving to ensure that spares are replenished in an effective manner. Providing data on the number of provisioned spares that are at zero balance (out-of-stock) will assist in assessment of the contractor's performance in providing effective logistics support. The contractor collects and reports this data in the Analytical Trends of Logistics Availability and Supportability (ATLAS) Report. Once the data validity and accuracy of the information in this report has been established, it may be used as the surveillance tool for this requirement.

A.3 Checklists (3a and 3b)

Checklists are used to conduct surveys and audits. Survey checklists (3a) are used to gather subjective inputs to determine whether or not a product or service was provided. Audit checklists (3b) are used to gather objective inputs to indicate whether or not a product or service was provided. The audit surveillance tool is defined in ISO 8402.

Examples of application of the checklist tool include:

- Periodic audit of contractor-generated hazard reports using a checklist developed from requirements documents
- Periodic audit of contractor's test equipment maintenance program using a checklist developed from the maintenance plan and other requirements as appropriate
- Periodic audit of contractor's launch team training and certification program using a checklist developed from the training plan and other requirements as appropriate

A.3.1 Tool Selection Factors

Factors to consider when selecting the checklist tool include:

- a. Survey and audit checklists are usually used for less critical activities where real-time insight of each occurrence of the activity is not necessary
- b. Survey checklists collect people's feelings and judgments

- c. Audit checklists are used to collect findings of fact related to a requirement
- d. Survey and audit checklist intervals are either specified or the survey/audit is conducted randomly
- e. Survey and audit checklists seldom reflect the quality of the service

A.3.2 Implementation Considerations:

The following considerations may be helpful during implementation planning:

- a. The type of survey or audit to be performed must be defined (i.e., process, product, functional, organizational, etc.)
- b. The checklist by which the survey or audit will be performed must be created
- c. The frequency of the survey or audit must be defined
- d. The frequency of the survey or audit may be adjusted as necessary based upon the checklist findings
- e. The survey and audit checklist process must be defined, including how evidence of the survey and audit activity will be documented and retained
- f. The anticipated workload

A.3.3 Example:

Detailed example of Checklist tool application:

Organization: PK

SOW Paragraph: 1.5.4.4.k

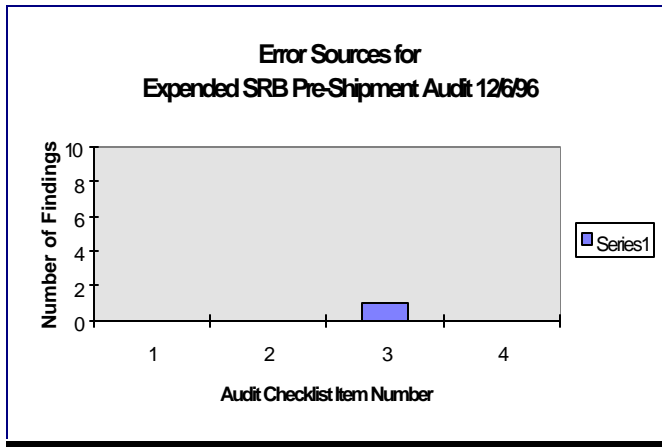
Action Text: Prepare SRB hardware for off-site shipment

Interest: PK interest is to assure that all necessary work is complete prior to shipment. PK personnel can use a simple audit to assure contractor personnel have satisfied this element of the SOW. When contractor personnel have indicated segments are ready to be shipped back to Utah, a form such as the following can be used. Satisfaction of all requirements on the audit form indicate acceptable performance with respect to this portion of the SOW.

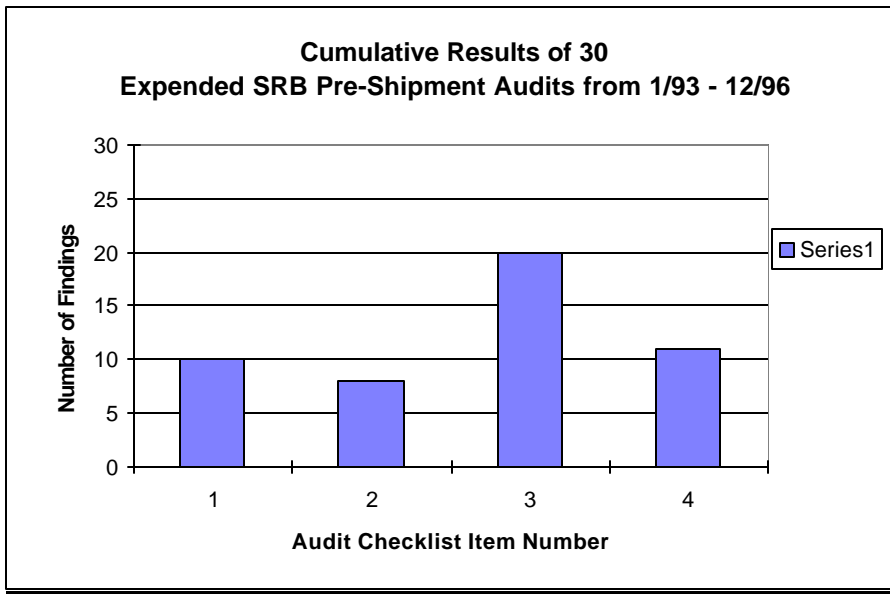
Expended SRB Pre-Shipment Audit Checklist

No.	Requirement	Yes	No
1	Post flight safing, cleaning and inspections are complete	X	
2	Components are properly preserved	X	
3	Segment is properly secured		X
4	No handling damage during on-load	X	

Displays:



Summarizing the data over time:



A.4 Sampling:

This is a quantitative approach to validating contractor performance. It involves statistically-based random checks of the contractor's data (performance and/or insight) or work performance. The purpose of these random checks is to validate that data is factual and that work performance meets requirements. Sampling will also provide an indication of the capability and stability (Just because a process is stable does not mean that it produces products meeting the requirements.) of the contractor's processes. Process capability is the ability of a process to produce results that fall within defined customer specification or contractual requirement. A stable process is a process in which variation in outcomes results from inherent system limitations.

Examples of application of the sampling tool include:

- Random Sampling contractor-generated Work Authorization Documents (WAD) using criteria which includes attributes of an acceptable WAD

- Random Sampling contractor performance of work steps in the K5NA mix, preparation and application process
- Random Sampling contractor facility maintenance operations using criteria which includes attributes of acceptable facility maintenance actions

A.4.1 Tool Selection Factors

Factors to consider when selecting the sampling tool include:

Sampling provides a means of measuring process capability and stability

Sampling data is collected by the government, independent of the contractor

Sampling is used when the government does not require evidence of acceptable contractor performance for each occurrence of a requirement

Sampling is a quantitative tool

Sampling can be resource intensive for the government

The sampling volume and frequency must support the required evaluation interval. For example, requirements that impact the Certification of Flight Readiness (COFR) endorsement may be sampled on a per flow basis, while requirements that do not impact COFR but may be evaluated for Award Fee purposes, may be sampled on a calendar interval basis.

A.4.2 Implementation Considerations:

The following considerations may be helpful during implementation planning:

- a. Sampling plans should be developed which define the following:
 - (1). What is to be sampled
 - (2). The sample size must be large enough to be statistically valid
 - (3). The sampling frequency must be sufficient to provide a statistical base
 - (4). The confidence required (confidence interval)
 - (5). The sampling criteria
 - (6). What is to be recorded (a completed criteria list) as evidence during the gathering of the sample
 - (7). Who performs the sampling, what organization or function
- b. Sampling plans should be developed with the assistance of personnel who possess in-depth knowledge and experience in statistical sampling techniques, while the implementation of the sampling plan and the on-going data collection can be performed by the process experts.
- c. The sampling process must be auditable. The government must establish records of its sampling activities as evidence of performing the sampling plan.
- d. All of the established sampling criteria in the criteria list must be met in order for the sample to be considered acceptable.

A.4.3 Example

Detailed example of Sampling tool application:

Organization: EY

SOW Paragraph: 1.5.1.3.i

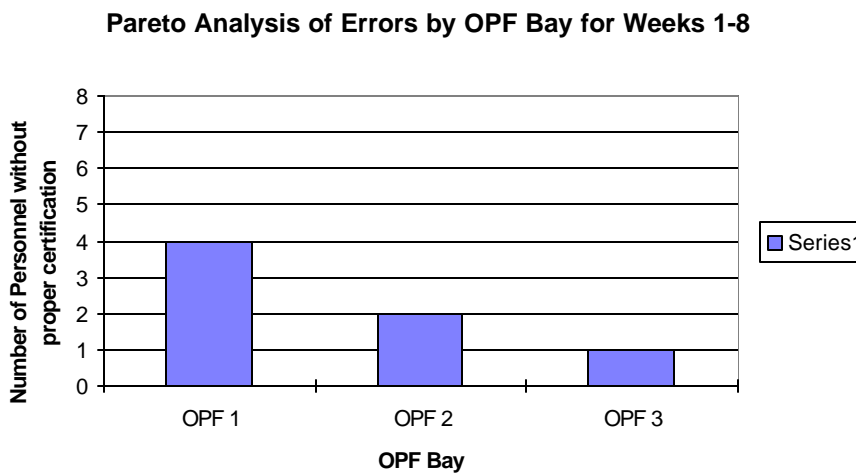
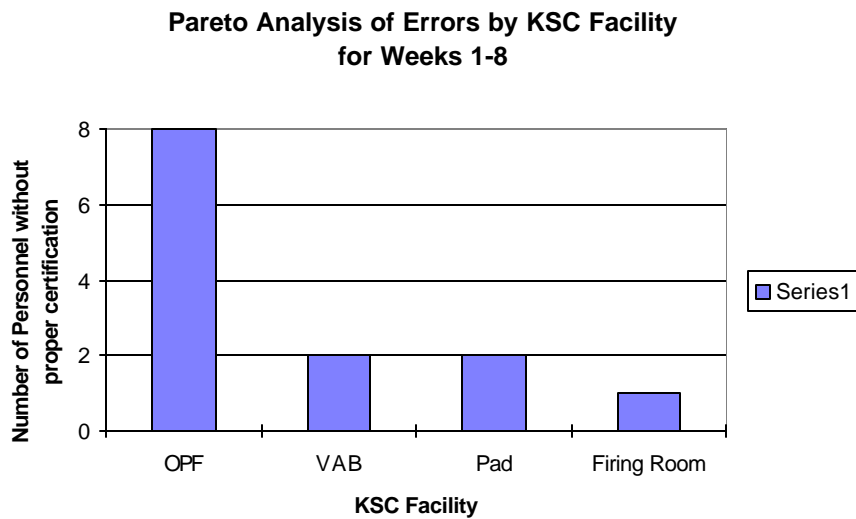
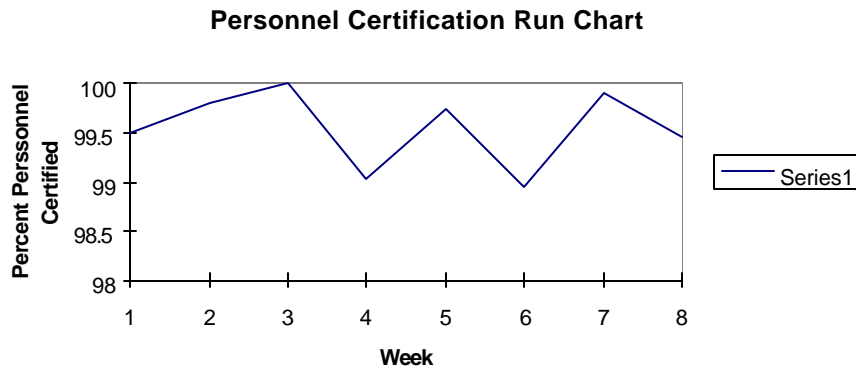
Action Text: Perform processing operations and testing involved in servicing of integrated vehicle

Interest: EY interest is to assure assembly operations are in accordance with applicable procedures and specifications, technicians are certified, contractor quality program is

valid/adequate and servicing is completed.

NASA Quality personnel can use Sampling as their tool of choice to ensure contractor conformance to this portion of the SOW with respect to Certification of personnel. A plan would be established for government employees to randomly sample areas (VAB, Pads, Firing Rooms, etc) to verify certifications of employees performing work. Tallies (possibly weekly) would be recorded and applied to a run chart. The run chart would be used to show capability (or lack of) of the process the contractor is using to ensure personnel are properly certified to perform a task. This data could be further analyzed to determine the variance of the process as an indicator of the stability of the process.

Display:



A.5 In-depth Observation (5)

This entails government personnel directly observing the contractor during performance of work. This tool may be used when government witnessing of each occurrence of a specific activity due to the government's need to assure that contractor performance is demonstrated. It is often used where the work involves tasks which present high risk to program assets, however use of the tool is not limited to such critical activities.

Examples of application of the in-depth observation tool include:

- Government personnel in attendance during execution of OMI A5214, Orbiter Roll Out to the Pad
- Government review of a contractor plan without signing it for approval
- Government attendance at contractor-run status meetings
- Government review of sustaining engineering documentation for configured systems

A.5.1 Tool Selection Factors

Factors to consider when selecting the In-depth observation tool include:

- a. In-depth observation does not represent a constraint to the contractor's authority to proceed. Lack of government attendance/approval does not keep the contractor from continuing work.
- b. In-depth observation allows the government to have real time insight into contractor performance and provides stop work authority for unacceptable work
- c. In-depth observation can be a risk mitigation/control tool for highly critical tasks
- d. In-depth observation is a qualitative tool
- e. In-depth observation can be a significant resource driver for NASA
- f. Data obtained from this application cannot be used in a sampling or statistically-based assessment of the contractor's performance since it is not truly random
- g. In-depth observation is best used by personnel who possess an in-depth knowledge and experience on the systems, tasks or disciplines involved.
- h. In-depth observation is a mechanism for maintaining civil service experience base and expertise

A.5.2 Implementation Considerations

The following considerations may be helpful during implementation planning:

- a. What is to be observed (specific processing operations, integrated operations, annual maintenance plan, etc.)
- b. Why the in-depth observation is needed (i.e., rationale)
- c. What criteria will be used to accept or reject the product or service
- d. How in-depth observation will be carried out
- e. Who performs the in-depth observation (what organization or function)
- f. How evidence of the in-depth observation will be documented
- g. The anticipated workload

A.5.3 Example: Detailed example of In-depth Observation tool application:

Organization: EI

SOW Paragraph: 1.5.4.1.d

Action Text: Integrate efforts to recover and tow Orbiter to the Orbiter Processing Facility or DFRF Mate-Demate Device, payload element destow, and early access platforms.

Interest: EI interest is to ensure all safety issues and concerns have been identified and resolved.

Safety concerns are paramount during recovery and towing operations at DFRF and the SLF. NASA Safety personnel will perform in-depth Observation during execution of these tasks. Their primary concern will be to identify and assist in the resolution of safety issues and they will have the authority to stop unsafe operations in real time. Although no statistical based metrics are developed as a result of in-depth Observations, the general performance of the contractor is observed. A simple checklist can be used to assist in the in-depth Observations and can be tailored to meet the needs of the Safety Management. The following list is an example of an informal check list which could be used when performing in-depth Observations.

Orbiter Tow Checklist

Safety clears established in a timely manner	Yes	No
Safety clears set for proper areas	Yes	No
Personnel properly attired	Yes	No
Proper safety briefing conducted prior to commencement of task	Yes	No
Walkdown of area conducted	Yes	No
All safety concerns identified prior to commencement of task	Yes	No

A.6 Inspection (6): KSC surveillance uses the ISO definition of inspection with some amplification.

This is an in-line function in which the government reviews and approves a specific contractor product or service. This in-line involvement represents a constraint to the contractor's authority to proceed further with the work. Inspection indicates approval and acceptance of a contractor requirement by the government and is performed for each occurrence of the requirement. The government may choose to use this surveillance technique due to high risk to program assets and a need to assure performance is demonstrated.

Examples of application of the inspection tool include:

- A NASA Process Engineer's signature on Type A TPS
- A NASA Test Director's signature on a launch countdown schedule
- A NASA Quality Assurance Specialist stamp on a close-out inspection

A.6.1 Tool Selection Factors

Factors to consider when selecting the inspection tool include:

- a. Government inspection represents a constraint to the contractor's authority to proceed
- b. Government inspection allows the government to have real time insight into contractor performance
- c. Government inspection is a risk mitigation/control tool for highly critical tasks
- d. Government inspection is a qualitative tool
- e. Government inspection may relieve contractor of liability
- f. Government inspection can be a significant resource driver for NASA

A.6.2 Implementation Considerations

The following considerations may be helpful during implementation planning:

- a. What is to be inspected (SPIs, WADs, Work Steps, etc.)
- b. Why the government inspection is needed (i.e., rationale)
- c. What criteria is used to accept or reject the product or service
- d. How inspection will be done
- e. Who performs the inspection (what organization or function)
- f. How evidence of the inspection will be documented
- g. The anticipated workload

A.6.3 Example: Detailed example of Inspection tool application:

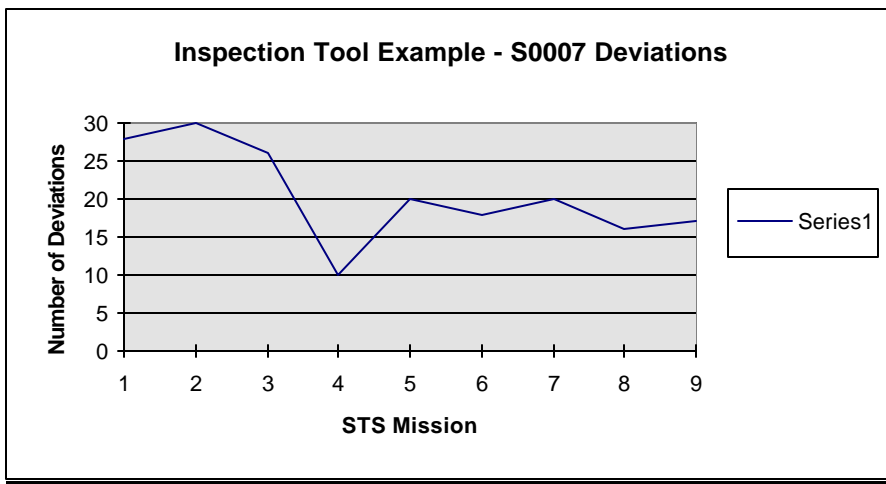
Organization: PZ

SOW Paragraph: 1.5.2.1.c

Action Text: Maintain integrated launch procedures

Interest: Assure procedures are reviewed for compliance and applicable requirements are coordinated with NASA representatives and integrated into procedures in a timely manner.

NTDs sign all S0007 deviations and are concerned with the number of permanent deviations for each flow. The contractor should be striving to minimize the number of permanent deviations to this document. Temporary deviations for single occurrence items, payload specific items, and similar requirements are anticipated. Therefore, a suggested metric in this area would be the number of permanent deviations to S0007 per launch flow. It is understood facilities are upgraded, orbiters modified, and similar changes occur, however S0007 deviations should remain a fairly stable number from flow to flow. After each launch, total number of permanent deviations are tallied and applied to a simple control chart. Once confidence is established that control limits are correct and the number of deviations stabilizes, aberrations outside the control limits should be investigated and corrective action, if necessary, taken.



Appendix B: Contractor Performance Demonstration Products and NASA Surveillance Activities: Trace to SFOC SOW

This appendix contains the results of the requirements analysis of the Space Flight Operations Contract Statement of Work. The contractor demonstration products (DRDs and metrics) were mapped to the SOW. In addition the NASA activity and the performing organization are also mapped to the SOW. These mapped requirements were partnered with the USA personnel to ensure that both USA and NASA were consistent when discussing contractor performance demonstration (USA) or performance assessment (KSC NASA).

The analysis is presented by SOW section. Starting on the left side of the table, the first column identifies the Ground Operations TMR responsibility⁶. The responsibility is categorized as either fully responsible, responsible for the ground operations portion, or responsible to provide management insight. The second column provides the content of the SOW section including SOW metrics and DRDs. The third column provides the contractor performance evidence such as metrics, DRDs, reports, etc. Column four identifies the NASA activity to perform insight or oversight of the contractor. The last column identifies the frequency for which the NASA activity is performed.

Ground Operations Surveillance Matrix

Responsible
Organization Key

PH, PH-M1, PH-P, PH-B, OP, TA, Appropriate Org.
PH-M2, PH-F, PH-G, PH-H, PH-J, PH-K

TMR Resp	SOW Section	Contractor Performance Evidence	NASA Activity	Frequency of NASA Activity
MI	1.1 PROGRAM AND BUSINESS MANAGEMENT This section defines the program and business management tasks that are to be performed by the contractor in order to develop and deliver the required SSP and ISSP operations services. The contractor is to effect these management functions through management approach, organization, and controls that are determined by the contractor to be optimum. The contractor shall provide and maintain program management systems, as outlined below, for the planning, organization, control, and reporting of all activities required by this contract. These systems shall be adequate to assure accomplishment of program technical and schedule requirements, and cost objectives.		See subsections below	
MI	1.1.1 PROGRAM MANAGEMENT The contractor shall provide for planning, management reviews, manifests & schedules, and risk management in support of contract requirements.		See subsections below	
MI	1.1.1.1 PLANNING The contractor shall provide and maintain a Management Plan (DR. 1.1.1.1-a). The contractor's management structure shall fully integrate all related plans and systems, including those of subcontractors and major vendors. The plan shall address the systems, functions, and data requirements described in this SOW. The contractor shall provide the Work Breakdown Structure (WBS) (DR 1.1.1.1-b). This WBS shall serve as the framework for contract planning, budgeting, cost reporting and schedule status to the NASA. Major elements of subcontracted work shall be identified in the WBS.	Project Management Plan	Review and Approve Project Management Plan	Every Publication

TMR Responsibility Key

- ✓ - Full Responsibility
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Contractor Performance Evidence

Data, Reports and/or Metrics generated by the contractor and used by NASA to assess performance (proof of performance required).

NASA Activity NASA activity used to review or assess contractor performance. Proof must be provided that activity was executed.

Frequency of NASA Activity Frequency required to assess contractor performance (e.g., once per specific flow activity, once per month, etc.).

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TMR Resp	SOW Section	Contractor Performance Evidence	NASA Activity	Frequency of NASA Activity
	<p>The contractor shall produce and maintain a strategic Space Flight Operations transition plan (DR 1.1.1.1-c). This planning activity shall provide strategies and schedules for effecting transition, and the contractor's metrics for determining the effectiveness of the transition for all Space Flight Operations elements and functions including the transition from the existing contractor/government relationship and responsibilities to the contractor's planned approach to manage this contract. The plan shall include the approach for increasing the contractor's accountability by translating NASA requirements into auditable plans, system procedures and work instructions. The contractor shall provide pre-transition contract programmatic assessment, and process evaluation/integration associated with Phase II contracts listed in Attachment J-1-C. In addition to its annual update, DRD 1.1.1.1-c will be updated upon transition of any Phase II contract (see Clause H.30).</p> <p>In order to establish a baseline, the contractor shall provide controlled work characterization descriptions as described in DR 1.1.1.1-f and DR 1.1.1.1-j.</p> <p>The contractor shall provide master planning and space utilization for assigned areas of responsibility.</p> <p>A privatization development plan shall be provided describing a general approach for potential involvement in providing SSP and ISSP type operations services to other customers and the business approach for potential commercial customers of the SSP (DR 1.1.1.1-d).</p> <p>The contractor shall develop and update plans for contingency situations (DR 1.1.1.1-e). These plans shall include planning for natural disasters; launch delay situations, off nominal</p>	<p>Contractor SPIs available on-line</p> <p>See Paragraphs 1.4 and 1.5 for Contingency Plans requiring GO TMR</p>	<p>NASA Signs critical SPIs per BM-001</p>	<p>SPIs approved for initial submittal and subsequent revisions</p>

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TMR Resp	SOW Section	Contractor Performance Evidence	NASA Activity	Frequency of NASA Activity
	<p>landings, major hardware failure safing/recovery situations and crew evacuations. A current list of contingency plans is included in Exhibit 1.1.1.1.</p> <p>The contractor shall provide white papers detailing significant program management decisions in accordance with the scope and requirements of DR 1.1.1.1-k.</p>	approval.		
✓	<p>1. DPD NO.: 821 ISSUE: BASIC 2. DRD NO.: 1.1.1.1-j</p> <p>3. DATA TYPE: 1 4. DATE REVISED:</p> <p>5. PAGE: 1/1</p> <p>6. TITLE: Shuttle Ground Processing Plans/Instructions</p> <p>7. DESCRIPTION/USE: To describe and baseline the contractor's standardized technical and operational plans and instructions required for the performance of the nine core processes for Ground Operations and definition of the required Government interfaces. This DRD defines specific action applicable only to the KSC Ground Operations portion of the SFOC. It is intended to be used at KSC in lieu of DRD 1.1.1.1-f, Space Flight Operations Product Development Plan.</p> <p>8. DISTRIBUTION: Per Contracting Officer's letter</p> <p>9. INITIAL SUBMISSION: Contract Authority to Proceed (ATP) plus six months</p> <p>10. SUBMISSION FREQUENCY: Updates annually, as required</p> <p>11. REMARKS:</p> <p>12. INTERRELATIONSHIP: SOW 1.1.1.1 and DRD 1.1.1.1-f</p> <p>13. DATA PREPARATION INFORMATION:</p> <p>13.1 SCOPE: The Ground Processing Plans/Instructions shall document the contractors planned implementation of and/or support to the nine Ground Operations core processes identified in the SFOC Program Management Plan (PMP) Section 7.0 and</p>	Contractor SPI index available on-line	NASA Signs critical SPIs per BM-001	SPIs approved for initial submittal and subsequent revisions

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Frequency of NASA Activity
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TMR Resp	SOW Section	Contractor Performance Evidence	NASA Activity	Frequency of NASA Activity
	<p>other appropriate Government requirements.</p> <p>13.2 APPLICABLE DOCUMENTS: None</p> <p>13.3 CONTENTS: Identification of baseline plans and processes required for contract implementation including process descriptions, data flow diagrams and process flow charts; applications, customers and organizational hand-offs; and process verification/integrity assurance methodology. The Ground Processing Plans/Instructions shall address the contractor's plans to implement the Government's requirements as a minimum in the following Ground Processing core processes: 1) work flow planning, 2) work instruction generation, 3) personnel training; 4) parts, material and services provisioning; 5) facilities and support equipment maintenance; 6) ground processing task execution, 7) ground processing information provisioning; 8) surveillance, and 9) requirements control. It is NASA's objective to transition away from explicit Government approval on these documents during the SFOC transition except for those plans involving critical ground processes or in-line functions performed by NASA personnel. The contractor shall consolidate and reduce existing processing plans and instructions that document like processes within these specific core processes.</p> <p>13.4 FORMAT: Contractor shall conform to delivery media formats and electronic data formats per DRD 1.1.4.1-e, Data Management Plan, or per Contracting Officer approval.</p> <p>13.5 MAINTENANCE: Changes shall be incorporated by change page or complete revision.</p>			
MI	1.1.1.2 MANAGEMENT REVIEWS		See subsections below	
MI	1.1.1.2.1 CONTRACT MANAGEMENT REVIEWS			

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TMR Resp	SOW Section	Contractor Performance Evidence	NASA Activity	Frequency of NASA Activity
	The contractor shall conduct Contract Management Reviews (CMR) to provide NASA with current status of the contractor's financial, work force, and technical activities. CMR's shall be conducted in accordance with an agreed-to schedule.	USA Ground Operations S&MA provides input and safety assessments to the PAR, SSRP, and PRCB		
MI	<p>1.1.1.2.2 PROGRAM REVIEWS</p> <p>The contractor shall participate in and support program meetings and reviews. This shall include presentations covering the contractor's areas of responsibility; identification of impacts due to proposed requirements changes; the planning and implementation of the program meetings and reviews; and the coordination and resolution of action items with NASA and other contractor representatives. Examples of these meetings and reviews are: Flight Readiness Review (FRR), the Prelaunch MMT Review, program level control/change boards, anomaly resolution meetings, and government and non-contractor design reviews that impact the contractor's area of responsibility.</p>	Participation in presentations at Program Reviews	<p>Preflight review meetings Chief Engineer as defined in KPH-010 insight plan under launch/landing execution</p> <p>Joint NASA and Contractor participation in Milestone reviews per KPD 8630.3. Attendance roster is maintained by USA, or Space Shuttle Program Office if Level II review.</p>	<p>Per flow</p> <p>Each Milestone per KPD 8630.3.</p>
MI	<p>1.1.1.2.3 FLIGHT READINESS</p> <p>The contractor shall review flight preparations to ensure flight readiness in accordance with NSTS 08117, Requirements and Procedures for Certification of Flight Readiness, and SSP 50108, Certification of Flight Readiness for Space Station. The contractor shall develop and implement an auditable approach to verify and ensure that flight preparation responsibilities and requirements are met and all problems dispositioned. This approach shall include as a minimum open item reviews, Flight Readiness Reviews (FRRs), Prelaunch MMT Reviews, pre-test briefings, and presentation of an integrated SFOC Certificate of Flight Readiness (CoFR) endorsement. This CoFR shall be prepared in accordance</p>	<p>PMS Metrics GO-123, GO-124</p> <p>Shuttle Engr. Directive (SED) T-55</p> <p>LRR- Engr. Req. Satisfaction (ERS)</p>	<p>Reviewed during NASA internal CoFR process per Insight plan KPH-010 (PE CoFR)</p> <p>Reviewed during NASA internal CoFR process per Insight plan KPH-010 (PE CoFR)</p> <p>NASA signature required on ERS as defined per SPI SP-507</p> <p>Joint NASA and Contractor participation in Milestone reviews per KPD 8630.3.</p>	<p>Per flow</p> <p>Each Milestone per KPD 8630.3.</p>

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TMR Resp	SOW Section	Contractor Performance Evidence	NASA Activity	Frequency of NASA Activity
	with DRD 1.1.1.2.3 and will include readiness statements that cover all processes and products required to satisfy the contractor's responsibilities and readiness to support launch, mission, and landing operations as defined in the above referenced documents.		Attendance roster is maintained by USA, or Space Shuttle Program Office if Level II review.	
MI	1.1.1.3 RESERVED			
MI	<p>1.1.1.4 RISK MANAGEMENT</p> <p>The contractor shall develop a risk management plan (DR 1.1.1.4-a) which details how the contractor will integrate safety, reliability, maintainability and quality issues and correlate those issues with cost, schedule and probability of mission success such that the contractor routinely considers risk in the planning and day-to-day decision making processes. The contractor shall provide a risk assessment (DR 1.1.1.4-b) with the complete relationship of the assurance issues (safety, reliability, maintainability and quality) to program goals (cost, schedule and mission success) with each topic and issue brought to program management for resolution. The risk assessment shall include the contractor's recommended means to mitigate the risk.</p> <p>The contractor shall report to the government all anomalies that potentially impact or constrain flight or key processing milestones and anomalies that represent safety, mission success, major program schedule milestones, or cost risks to the government. The contractor shall obtain government approval of out-of-family anomaly dispositions (DR 1.1.1.4-c) which are defined as anomalies which involve one or more of the following:</p> <ul style="list-style-type: none"> involve the first-time occurrence of a failure mode limit hardware life restrict hardware or software use affect the performance or reliability of safety or mission 	<p>USA Ground Operations S&MA provide Safety assessments to support the Risk Management activities of USA</p> <p>PRACA</p>	<p>Support reviews as requested by JSC/MA.</p> <p>Participate as PRCB member.</p> <p>Review all GO risk assessments.</p> <p>Chair Risk Review Board and accept changes. Participate in PRCB.</p> <p>Chair MRB.</p> <p>Review/Approve Out of Family dispositions as defined per SPI and KPD-P-1689 and Insight plan KPH-010</p>	<p>As needed</p> <p>As needed</p> <p>As needed</p> <p>As needed</p> <p>As needed</p> <p>Continuous</p>

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PH-M2, PH-F, PH-G, PH-H, PH-J, PH-K

TMR Resp	SOW Section	Contractor Performance Evidence	NASA Activity	Frequency of NASA Activity
	success critical hardware functions <ul style="list-style-type: none"> affect hazard control result in a weight change in excess of 2 pounds (equivalent weight to orbit) affect flight or ground operating procedures that are controlled by the government change software or hardware configuration allow use of hardware that does not meet performance specifications, exceeds certification limits, or surpasses time, age, or cycle life limits (waivers/exceptions) close or defer resolution of an unexplained anomaly requires government design element analysis or assistance affect critical hardware manufacture or repair processes 			
MI	1.1.1.4 SOW Metric Required Service: Reporting anomalies to the appropriate government interface. Standard: All anomalies reported in accordance with applicable NSTS 08126, and SSP 30229 requirements. MER: 2% of anomalies reported late but in no case greater than 2 day beyond specified requirements, and no out-of-family anomalies reported late. Standard: All anomalies and non-conformance s that occur during or constrain launch countdown and flight operations reported as soon as practical. MER: 0%		Sample all PRACA to verify adherence to guidelines for out-of-family/in-family reporting. Data recorded in NASA PITA database.	Continuous
MI	1.1.2 FINANCIAL RESOURCES AND PERFORMANCE MANAGEMENT			

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Frequency of NASA Activity

Frequency required to assess contractor performance (e.g., once per specific flow activity, once per month, etc.).

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PH-M2, PH-F, PH-G, PH-H, PH-J, PH-K

TMR Resp	SOW Section	Contractor Performance Evidence	NASA Activity	Frequency of NASA Activity
	The contractor shall provide and maintain a resource management system for the accumulation, documentation, and analysis of cost and work force data. The resources management system will be the basis for communication with NASA concerning financial planning and control, accounting of accrued expenditures and other liabilities, evaluation of cost performance, and forecasting of cost and work force requirements (reference SOW section 1.1.2.1). The financial management system shall provide the baseline of financial parameters to be input and assessed in the integrated Performance Measurement System (PMS).		See subsections below	
MI	<p>1.1.2.1 FINANCIAL RESOURCES MANAGEMENT</p> <p>The contractor s financial reporting (DR 1.1.2.1-a) shall be provided in accordance with NPG 9501.2C. These financial reporting requirements are applicable to all tiers of subcontractors with annual expenditures of \$5 million or more or with a total contract value of \$10 million or more. In addition, the contractor shall provide an on-line database (DR 1.1.2.1-b) accessible to NASA which provides accurate and timely resource information such as resource plans, staffing, and actuals. The contractor shall manage and control work and resources within discrete program fund sources and program funding levels approved by NASA.</p> <p>The contractor shall provide financial planning as required to support the government budget process (i.e., Program Operating Plan [POP] budget calls, monthly operating plan budget calls, and CofF budget calls), and to support special requests for budget impacts. The format and content of the contractor s inputs and supporting rationale shall be in accordance with the budget or special request guidelines and reporting format specified by the NASA.</p>	<ul style="list-style-type: none"> Contractor Website of Energy usage. Develop trends and estimations. Attendance of KSC Energy work group. Contractor Website of maintenance budget trending. Provide maintenance data for submittal to Code JX .(NASA Integrates KSC contractor inputs) 	<p><u>1.1.2.1-d Energy Utilization</u></p> <ul style="list-style-type: none"> Review Website data Compare w/SGS and FPL energy consumption reports. Observe trends and estimations. Partner DRD changes Provided Award Fee input <p><u>1.1.2.1-c Facilities Maintenance Costs</u></p> <ul style="list-style-type: none"> Review maintenance cost trends (plan vs. actual by facility) required by Maintenance Plan (DRD 1.5.5.2) Partner DRD changes Review data submitted to 	<p>Quarterly</p> <ul style="list-style-type: none"> Quarterly trends Annual budget submit to Code JX

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TMR Resp	SOW Section	Contractor Performance Evidence	NASA Activity	Frequency of NASA Activity
	The contractor shall conduct monthly (normally one day prior to the CMR) Resources Management Reviews (RMR) providing NASA with insight into the contractor s, subcontractors , and vendors overall work progress and financial status. The contractor shall track and report facilities maintenance costs (DR 1.1.2.1-c), energy utilization and consumption (DR 1.1.2.1-d), on-site and off-site headcount (DR 1.1.2.1-e), and geographical economic impacts (DR 1.1.2.1-f).		NASA Code JX for Maintenance, BMAR, etc.	
MI	<p>1.1.2.2 PERFORMANCE MEASUREMENT</p> <p>For operations activities, the contractor shall develop and maintain a PMS (DR 1.1.2.2-b). The level of detail for this system shall be consistent with the maturity and stability of the program elements. Performance measurement reporting is also required on subcontracts that, based on risk, schedule criticality, or dollar value, have the potential to impact the successful fulfillment of this contract</p> <p>The contractor shall develop and maintain performance metrics which effectively indicate the level of success in execution of the contract requirements, including definition/development of the metrics, correlation of the metrics to the requirements, and measurement of management responsiveness to the performance indicated by the metrics.</p> <p>For development and production efforts which may be authorized in this contract, the contractor shall provide PMS reporting (DR 1.1.2.2-a) in accordance with NMI 9501.1 which correlates work accomplished and actual costs against baseline cost plans and schedules.</p>	<p>Partner and approve Ground Operations performance metrics to be used by NASA and Contractor (Ground Operations APM/TMR Metrics Agreement)</p> <p>Quarterly Review data, Two-minute charts, and POP submit data. Data maintained on Shuttle and Station PMO server and as</p>	<p>Monthly and Quarterly reviews of project data highlights with Shuttle and Station PMO. Quarterly Reviews with Shuttle Processing Directorate Management,</p>	<p>Monthly and Quarterly reviews. Year-end close-out reviews.</p>

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TMR Resp	SOW Section	Contractor Performance Evidence	NASA Activity	Frequency of NASA Activity
	A summary of the PMS report shall be provided in the monthly RMR. The contractor shall provide NASA direct electronic access to the contractor PMS system. Technical issues and accomplishments, analysis of cost and schedule performance, and corrective actions in problem areas shall be provided.	hardcopies with Shuttle and Station PMO. Monthly Operating Plan for Launch and Landing Projects PMR Status Report (pink book)	Annual POP review with KSC and Shuttle Program management	
MI	1.1.3 CONTRACT MANAGEMENT The contractor shall provide overall management of the contract requirements.		Accept Customer feedback and enforce contract requirements as necessary Coordinate audit functions and results performed by cognizant IG/DCAA/DCMC Surveillance Process as a whole ensures requirements are being met	Continual Continual
MI	1.1.3.1 PRIME CONTRACT MANAGEMENT The contractor shall perform those tasks associated with administering the contract.		Management interface meetings with USA Contract Management	Weekly
MI	1.1.3.2 SUBCONTRACT MANAGEMENT The contractor shall accomplish the management and technical control of interdivisional, subcontractor, and major vendor activities required to fulfill the contract. The plan for		Perform periodic reviews of the contractor purchasing system IAW Surveillance Plan. Review and consent to	Bi-annually As required

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TMR Resp	SOW Section	Contractor Performance Evidence	NASA Activity	Frequency of NASA Activity
	managing the subcontract effort is described in the management plan (DR 1.1.1.1-a). The PMS shall provide appropriate management visibility into all aspects of interdivisional, subcontractor, and major vendor activities and shall be integrated with other required management systems and reporting requirements of the prime contractor. A system of management reviews and reports shall be incorporated to provide a reliable status of progress and performance measurement.		subcontracts in accordance with FAR requirements and established thresholds	based upon thresholds
MI	1.1.4 INFORMATION AND DOCUMENT MANAGEMENT The contractor shall provide information management, and document management in support of contract requirements.		See subsections below	
MI	1.1.4.1 INFORMATION MANAGEMENT The contractor shall develop, maintain, and operate and secure information systems which provide for the management, preparation, publication, control, and dissemination of information and data required by this contract. These systems shall be described in an information management plan (DR 1.1.4.1-a), and a data management plan (DR 1.1.4.1-e), which defines an integrated approach to the information management activities of this contract and includes the management of documentation (in any media), automated databases, and related products. The contractor shall describe the areas of the contractor's internal systems where NASA access will be permitted and shall define access and interface requirements and provide NASA the required training to be able to access and use these systems. The government systems that are currently being used will be made available to the contractor and are identified in Attachment J-9.	Deliver USA Technology Plan	Review and recommend acceptance or modification to KSC CIO on USA Technology Plan Provide Authority to Proceed per NPG 2810.1	Every publication Each request

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	<p>The contractor's information management activities shall include operating and maintaining a data repository or repositories, as required, for originals in any media including classified and proprietary documents. The contractor shall maintain files of the documentation required to perform all the tasks in this SOW. The contractor shall establish a formal documentation release system and a system for rapid retrieval of all records.</p> <p>The contractor shall establish and implement a program-wide (i.e. contract-wide) information technology (I/T) planning and reporting process (DR 1.1.4.1-b).</p>		Support KSC Shuttle Processing CIO Tag Up meetings on IT issues	Bi-monthly
MI	<p>1.1.4.2 DOCUMENT MANAGEMENT</p> <p>The contractor shall maintain accurate originals and shall prepare and distribute NASA approved changes to SSP and operations baseline documentation. This includes the NSTS 07700 documentation series.</p>		Support Appropriate TMR on request	As needed
MI	<p>1.1.4.3 YEAR 2000 COMPLIANCE</p> <p>Year 2000 compliant, as used herein, means that the information technology (hardware, software and firmware, including embedded systems or any other electro-mechanical or processor-based systems used in accordance with its associated documentation) accurately processes date and date-related data (including, but not limited to, calculating, comparing, and sequencing) from, into, and between the twentieth and twenty-first centuries, and the years 1999 and 2000 and leap year calculations, to the extent that other information technology, used in combination with the information technology being acquired, properly exchanges date and date-related data with it.</p> <p>Any information technology provided, operated and/or</p>	Testing and documentation complete. Rollover occurred successfully.	Review and oversight of readiness activities	Activity complete

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TMR Resp	SOW Section	Contractor Performance Evidence	NASA Activity	Frequency of NASA Activity
	<p>maintained under this contract must be Year 2000 compliant. To ensure this result, the Contractor shall prepare Year 2000 documentation describing how the IT items or services demonstrate Year 2000 compliance. Clause H.30, <i>Consolidation of Phase II Contract Requirements</i>, contemplates the consolidation of additional contract requirements into this contract over time. The contractor is not responsible for Year 2000 compliance for the following Phase II contracts: NAS 8-36200, External Tanks; NAS 8-38100; Reusable Solid Rocket Motors; and, NAS 8-45000, Space Shuttle Main Engines.</p> <p>Milestones for Renovation, Validation and Implementation: Any IT determined to be non-Year 2000 compliant shall be replaced, retired, or repaired in accordance with the following schedule:</p> <ul style="list-style-type: none"> Renovation includes making and documenting software and hardware changes, developing replacement systems, and decommissioning systems to be retired. The Contractor must complete renovation of affected software, hardware and firmware by September 30, 1998. Validation includes unit, integration, system, and end-to-end testing for Year 2000 compliance. The Contractor must complete validation and testing of converted or replaced systems by January 31, 1999. Implementation includes acceptance testing and integration of converted and replaced systems into a production environment. The Contractor must complete implementation by March 31, 1999. <p>At a minimum, the Contractor shall provide documentation, including project plans and status reports, which demonstrate that the Contractor is meeting the milestones listed above. Status reporting will be provided by the Contractor in</p>			

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	accordance with DRD 1.1.4.3-a.			
MI	<p>1.1.5 CONFIGURATION AND VERIFICATION MANAGEMENT</p> <p>The contractor shall provide a configuration management system and a verification management program as described in SOW sections 1.1.5.1 and 1.1.5.2.</p>		See Subsections Below	
MI	<p>1.1.5.1 CONFIGURATION MANAGEMENT</p> <p>The contractor shall, in accordance with NSTS 07700, provide a configuration management (CM) system including identification, control, verification, and accounting for facilities, hardware and software/firmware for which the contractor is responsible. The contractor shall also provide configuration management products for the NASA change evaluation and control process. This will include action item status; preparing and coordinating Program Requirements Control Board Directives (PRCBD s), other program level control/change board directives, and Project level change board directives; maintaining accurate, complete, and current CM data in the appropriate databases to ensure implementation and verification of program direction. The contractor shall also distribute, coordinate, and track NASA change evaluations for the Engineering Directorate.</p> <p>A configuration management plan shall be provided (DR 1.1.5.1).</p>		<p>Reviewed during NASA internal CoFR process per Insight plan KPH-010 (PE CoFR)</p> <p>NASA signature required on ERS as defined per SPI SP-507</p>	<p>Continuous</p> <p>As needed</p>
MI	<p>1.1.5.2 VERIFICATION MANAGEMENT</p> <p>The contractor shall implement a verification management program in accordance with NSTS 07700 to ensure hardware/software processing and configuration requirements are accomplished. A verification management plan shall be provided (DR 1.1.5.2-a).</p>			

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	<p>The contractor shall track, satisfy and verify the flight element processing requirements, integrated processing requirements, flight operations requirements, facilities and systems requirements; and verify that the as built configuration is in accordance with the approved engineering and program direction. In addition, the contractor shall administer the documentation of requirements in the requirement system. These requirements are currently managed through such systems as the Operations and Maintenance Requirements Specification Document (OMRSD) system, Baseline Accounting and Reporting System (BARS), Configuration Verification Accounting System (CVAS), MSFC Baseline Accounting and reporting System (MBARS), Mission Requirements Control System (MRCS), Configuration Verification (CV), Problems Action Data System (PADS), Shuttle Integrated Accounting Status System (SIASS), Time, Age, Cycle Control System (TACCS), and Tile Information Processing System (TIPS).</p> <p>The contractor shall be responsible for the development, implementation, maintenance, and operation of the shuttle configuration requirements application support software databases and systems (e.g. In-Flight Anomalies [IFA], TACCS, Technical Document Management System [TDMS])(DR 1.1.5.2-d).</p> <p>The contractor shall maintain the configuration requirements database for program level baselined configuration requirements to support configuration verification (DR 1.1.5.2-b).</p> <p>Combined element (integrated vehicle) verification will be accomplished. This activity requires that the contractor</p>	<p>PMS Metrics A-GO-001, GO-123, GO-124</p> <p>SPI s</p> <p>Engr. Req. Satis.</p>	<p>Reviewed during NASA internal CoFR process per Insight plan KPH-010 (PE CoFR)</p> <p>NASA signature required on ERS as defined per SPI SP-507</p>	<p>Continuous</p> <p>As needed</p>

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	provide support to verify combined-element compliance with Master Verification Plan volumes MVP-01 and MVP-02 and Orbiter compliance with MJ072-0004-3A. Update MVP-02 and MJ072-0004-3A as required. In addition, the contractor shall publish reports concerning verification status for each element relative to the NSTS 07700, Volume 10 requirements baseline.			
MI	<p>1.1.6 GOVERNMENT FACILITY, PROPERTY AND SECURITY MANAGEMENT</p> <p>The contractor shall perform facility, property and security management as described herein. The contractor shall manage, operate, maintain and provide engineering for the Government Furnished Property (GFP) delineated in Attachment J-9. GFP will be transitioned to the contractor in accordance with Attachment J-9. Additional KSC site specific requirements for facilities operations, maintenance and sustaining engineering are included in SOW section 1.5.5.</p>		See Subsections Below	
MI	<p>1.1.6.1 FACILITY MANAGEMENT</p> <p>The contractor shall provide a Facility Management Plan (DR 1.1.6.1-a) which shall describe approach to managing facilities responsibilities. The contractor shall conduct quarterly Facility Management Reviews (FMR) providing NASA with insight into the contractor s and subcontractors facility management status. The contractor shall manage assigned facility space to accommodate contractor, NASA, other Government agencies and non-Government tenants as required. The contractor shall provide planning, development and integration of facility projects required in the performance of this contract.</p> <p>The contractor shall analyze, design, construct, acquire, relocate, install, modify and improve contractually obligated</p>	<ul style="list-style-type: none"> ■ Contractor Data ■ Facility Data ■ Project Data 	<ul style="list-style-type: none"> ■ Attend Quarterly Reviews ■ Facility Reviews ■ Project Reviews ■ Award Fee on performance ■ Review KSC portion of Program integrated input. 	Quarterly

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	<p>facilities as required and provide required facility project reporting. (DR 1.1.6.1-b) Requests for facility projects not anticipated and identified in prior submissions shall be submitted when identified and include project prioritization and documentation. Project requests shall include a comprehensive requirements document, as required, in sufficient detail to allow for an independent cost estimate of all scope and related issues identified to accomplish the project. All siting plans must be approved by the Government.</p> <p>The contractor shall provide a quarterly review of all facility projects to include requirements documents, studies, Preliminary Engineering Reports (PER), design, construction, activation, environmental issues, schedule (including completion milestones), change orders, potential scope growth, and access/support.</p> <p>The contractor shall provide engineering support for project studies, design, implementation, activation and turnover related to NASA managed facility modifications in accordance with SOW section 1.7.1.</p> <p>The contractor shall implement a comprehensive proactive maintenance program incorporating reliability centered maintenance in accordance with NHB 8831.2, as required, and submit a maintenance plan (DR 1.5.5.2) for assigned facilities and facility systems. The contractor shall provide systems, facilities and equipment hardware/software/firmware sustaining engineering that meets the original design intent, develop the applicable engineering documentation, implement the appropriate modifications, and maintain this documentation current.</p>			

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	The contractor shall provide a transition plan (DR 1.1.1.1-c) which shall include the facility responsibilities to be transitioned to SFOC.			
MI	<p>1.1.6.1 SOW Metric 1</p> <p>Required Service: Deliver specified end products on schedule and stay within negotiated budget</p> <p>Standard: All end products are delivered on schedule</p> <p>Expected: 85% of all end products delivered on schedule</p> <p>MER: 70% of all end products delivered on schedule</p> <p>* End products referred to in this metric are studies, designs, facility project construction completion, financial completion.</p>		Support Program Integration TMR	As required
MI	<p>1.1.6.1 SOW Metric #2</p> <p>Required Service: Maintain systems, software, firmware, facilities and equipment.</p> <p>Standard: Perform 100% of all planned maintenance tasks delineated in the yearly maintenance plan (ref. DR 1.5.5.2).</p> <p>Expected: Perform 90% of all maintenance tasks delineated in the yearly maintenance plan</p> <p>MER: 15% of tasks not completed, 85% completed but in no case impact safety, mission success or major program schedule milestones.</p>	PMS SOW Metric A-GO-006, Maintain Systems, Software, Firmware, Facilities and Equipment	Metric assessed by PH-J and available on line at http://www-ph.ksc.nasa.gov/PerformanceMetrics/metrics.htm .	Quarterly
MI	<p>1.1.6.2 PROPERTY MANAGEMENT</p> <p>The contractor shall provide a fully operational Property Management Plan (DR 1.1.1.1-h). The contractor shall provide quarterly Property Status Reviews providing NASA</p>	PMS SOW Metric A-GO-102, Property Damage	Metric assessed by PH-P and available on line at http://www-ph.ksc.nasa.gov/PerformanceM	Quarterly

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	with insight into the contractor s and subcontractors property management status. Within the contract, the loan or transfer of property between NASA centers or remote sites shall be processed in accordance with procedures identified in the Property Management Plan (DR 1.1.1.1-h) insuring management and engineering reviews and approvals are obtained prior to movement, as appropriate. The contractor shall insure appropriate property, tracking and statusing records are adjusted accordingly as such transfers and movements are authorized.		etrics/metrics.htm.	
MI	1.1.6.2 SOW Metric Required Service: Maintain approved property management systems and satisfactory ratings for each category in accordance with NFS Tables 18-45-1 and -2B to subpart 18-45.72. Standard: Meet criteria for satisfactory rating in all rating categories. Expected: Satisfactory rating in 80% of all rating categories with recovery of each unacceptable within 60 days. MER: Satisfactory rating in 65% of all rating categories with recovery of each unacceptable within 90 days.		Support Program Integration TMR	As required
MI	1.1.6.3 SECURITY MANAGEMENT The contractor shall establish effective and comprehensive Industrial, Physical, Administrative, Information, Communications and AIS security programs in accordance with the National Industrial Security Program Operating Manual, NASA site specific regulations, SFOC Security Management Plan (DR 1.1.6.3-a) and DD Form 254. The	PMS SOW Metric A-PI-032, Security Escape Incident Rate	Metric assessed by PH-P and available on line at http://www-ph.ksc.nasa.gov/PerformanceMetrics/metrics.htm . Support Program Integration	Quarterly As required

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	<p>contractor will provide protection/safeguarding of personnel, facilities, assets, equipment, classified information/materials, and unclassified sensitive/technological data/information as required. The contractor will support secure flight, engineering, and operations of secure facilities and systems through the implementation and adherence to SFOC requirements. In accordance with NASA and DoD regulations governing National Security and National Resource Protection, the contractor shall provide security engineering, maintenance, and operations for systems protecting classified information transmitted or processed by electronic means, and for Orbiter and Space Station uplink command streams. These functions require the application of physical, communications, information, and personnel security, and configuration management. The contractor will act as the COMSEC controlling authority for certain encrypted communications, and provide technicians certified to perform limited cryptographic maintenance and operations.</p> <p>The contractor shall conduct quarterly Security Management Reviews (SMR) providing NASA with insight into the contractor s and subcontractors security management program including processes and controls.</p>		TMR	
MI	<p>1.1.6.3 SOW Metric</p> <p>Required Service: Provide physical access/egress, classified (CI) information and violence/damage control.</p> <p>Standard: No security violations, anomalies, unauthorized CI disclosures, and preventable security incidents.</p> <p>MER: No violations or incidents that result in compromises, disclosures, serious personal injury or intentional physical</p>	PMS SOW Metric A-PI-032, Security Escape Incident Rate	Metric assessed by PH-P and available on line at http://www-ph.ksc.nasa.gov/PerformanceMetrics/metrics.htm .	Quarterly

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MI	<p>damage.</p> <p>1.1.7 MANIFESTS AND SCHEDULES</p> <p>The contractor shall provide timely analysis and data to support the government managed manifest planning efforts by providing data relative to processing plans and timelines, launch rate capability, schedules, flight hardware/software/equipment utilization plans, facility/equipment utilization plans, prioritization assessments, ascent performance margins, downweight determinations, cargo mass properties and payload/cargo compatibility. The contractor shall assess the viability of government provided manifests and manifest options. This includes risk mitigation (cost and schedule), assessing potential impact to mission performance, conducting internal studies to reduce turnaround times, and requirements analysis.</p> <p>The contractor shall support the NASA working groups in the development, definition, assessment, and modification of the Shuttle manifest and the top level program schedules and deliver products (DR s 1.1.7-a, & 1.1.7-d).</p> <p>The contractor shall provide support to the manifest and mission integration process through the support of payload and mission integration schedule documentation development and maintenance. This includes the program documentation developed to acknowledge program commitments to customers for integrating their payloads and establishment of mission requirements/objectives for each flight, preparation of NASA interfacing schedule documentation with payload customers, and customer support room (CSR) service for payload customers.</p> <p>The contractor shall demonstrate schedule performance by</p>	The Contractor creates manifest and schedule products.	NASA routinely evaluates manifest and schedule products produced by the Contractor and publishes a quarterly Work Flow Planning Evaluation Report addressing these products.	Quarterly

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	<p>accomplishment of the manifest and established Program milestones. The contractor shall demonstrate schedule performance based on the degree the planned and scheduled work for a particular element activity, flow or integrated flow correlates to the actual work (as run data) performed during that element activity or flow. The contractor shall analyze major variances to these measures, identify causes for these variations and make recommendations or refinements to the applicable processes to improve schedule performance and reduce schedule risk.</p> <p>The contractor shall perform all scheduling activities (detail near term and long range) to support all flight element activities, integrated processing, flight operations activities and assigned systems, facilities, and equipment activities. The contractor shall utilize a planning and scheduling process that provides the necessary identification, coordination, sequencing, control and tracking of operational activities at all operational sites. The contractor shall provide accurate and reliable scheduling information that provides the government sufficient insight into the contractor's ability to fully analyze, mitigate and control scheduling risks, maximize schedule stability, minimize milestone impacts, optimize resource utilization, and other performance metrics (DR s 1.1.7-b and 1.1.7-c).</p> <p>Effective August 22, 1998, the contractor will assume Payload Integration Management (PIM) responsibility for all GAS payloads; and up to twelve (12) active flight requests selected by NASA from either complex FTSOD test articles, middecks, or cargo bay secondary payloads. The contractor shall prepare Integration Plans (IPs) for NASA-Assigned Payloads in accordance with the requirements of DR 1.1.7-e. PIM responsibility for primary science payloads and ISS</p>	<p>SPIs SP-505 Scheduling and SP-506 Computer-Aided Planning and Scheduling System (CAPSS) Operations are critical SPIs requiring NASA review and approval.</p>	<p>Initial and subsequent revisions approved by NASA.</p>	<p>As needed</p>

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	launch packages are not included in this task.			
MI	<p>1.1.7 SOW Metric</p> <p>Required Service: Meet major program schedule milestones as defined in NSTS 07700, Vol. III, NSTS 08178, and SSP 50200-02, Vol. II .</p> <p>Standard: Meet major program schedule milestones.</p> <p>MER: No impacts to these dates due to contractor performance.</p>	The Contractor documents accomplishment of milestones in as-run manifest products.	NASA compares actual milestone completion date to planned date and determines reason for delta. Publish Critical Path Assessment reports.	As required.
MI	<p>1. DPD NO.: 821 ISSUE: REVISION 1 2. DRD NO.: 1.1.7-b</p> <p>3. DATA TYPE: 1/2/3/4 4. DATE REVISED: 09/01/98</p> <p>5. PAGE: 1/3</p> <p>6. TITLE: Integrated Ground and Flight Operations Schedules</p> <p>7. DESCRIPTION/USE: To provide accurate and reliable implementation planning, scheduling and assessment tools for operational use at JSC and KSC.</p> <p>8. DISTRIBUTION: Per Contracting Officer's letter</p> <p>9. INITIAL SUBMISSION: In accordance with Item 13.3g</p> <p>10. SUBMISSION FREQUENCY: See Item 13.</p> <p>11. REMARKS:</p> <p>12. INTERRELATIONSHIP: SOW 1.1.7</p> <p>13. DATA PREPARATION INFORMATION:</p> <p>13.1 SCOPE: The Integrated Ground and Flight Operations Schedules define required scheduling information in support of Shuttle, ISS and Payload-to-Shuttle integration operations, and assess progress at achieving these schedules.</p> <p>13.2 APPLICABLE DOCUMENTS: None</p> <p>13.3 CONTENTS: General Criteria:</p> <p>a. The contractor shall develop, maintain (update),</p>	The Contractor creates planning and scheduling products.	<p>NASA routinely evaluates planning and scheduling products produced by the Contractor and publishes a quarterly Work Flow Planning Evaluation Report addressing these products.</p> <p>Specific products indicated in DRD paragraph 13.3 Contents: KSC Ground Operations are included in the Gray Book which is reviewed and approved by NASA. These are items c, d, g, and i.</p>	<p>Quarterly</p> <p>NASA approval of initial and subsequent submittals.</p>

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	<p>provide and ensure a consistent, accurate, and stable scheduling approach that provides for the identification, coordination, sequencing, control, implementation and tracking of all operational activities and is easily auditable by the Government.</p> <p>b. The approach shall provide the ability to fully identify, analyze, mitigate and control scheduling risks and impacts; accurately identify, coordinate and optimize facility and resource utilization; identify and analyze critical path activities; and allow its users to easily measure the progress towards achieving the intended plan.</p> <p>c. The scheduling approach shall not only represent the scheduled work for that operation, but also the requirements commitment from all the supporting organizations.</p> <p>d. The contractor is encouraged to utilize modern manufacturing resource planning, industrial engineering techniques and other approaches, (e.g., job standardization, resource leveling and optimization, critical path analysis, standardized processing flow approaches, etc.) to ensure schedule stability, accuracy, reliability, predictability, and achievability.</p> <p>e. <i>Schedule consistency</i> shall be defined as the degree to which the contractor utilizes standardized scheduling approaches between similar processing activities and flows. <i>Accurate scheduling</i> shall be defined as the accurate representation of work content and tasks duration (predicted vs. actuals). A <i>stable schedule</i> shall refer to the degree to which daily schedule changes are minimized and limited to unforeseen</p>			

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	<p>hardware/software problems or NASA-directed changes.</p> <p>f. Scheduling approaches shall address the following information as a minimum:</p> <ol style="list-style-type: none"> 1. Scheduling symbology that is consistent with that particular operational area. 2. Predicted task duration/labor standards derived from accurate and objective prediction methodologies. 3. Indications of activities by appropriate nomenclature that clearly delineates the task to be performed and any associated Work Authorization Documents. 4. Identification of who is responsible for doing the actual work. 5. Required supporting activities or support from other contractors, outside organizations, agencies or centers. 6. Identification of critical resource requirements. 7. Clear depiction of the interrelationships and constraints among related tasks. 8. Identification of the critical path, priorities, high risk activities and other significant activities. 9. NASA-approved milestones and Cargo-to-Shuttle interface activity and need dates. 10. Major facility/system outages/modifications/O&M activities. 11. Special test activities or requirements. 12. Identification of hazardous operations and special safety requirements. <p>g. Required data:</p> <p>KSC Ground Operations. Shall cover as a minimum the following activities in</p>			

TMR Responsibility Key

- ✓ - Full Responsibility
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- MI - Management Insight

Contractor Performance Evidence

Data, Reports and/or Metrics generated by the contractor and used by NASA to assess performance (proof of performance required).

NASA Activity NASA activity used to review or assess contractor performance. Proof must be provided that activity was executed.

Frequency of NASA Activity Frequency required to assess contractor performance (e.g., once per specific flow activity, once per month, etc.).

Ground Operations Surveillance Matrix

Responsible Organization Key PH, PH-M1, PH-P, PH-B, OP, TA, Appropriate Org.
PH-M2, PH-F, PH-G, PH-H, PH-J, PH-K

TMR Resp	SOW Section			Contractor Performance Evidence	NASA Activity	Frequency of NASA Activity
	addition to the above information:			Frequency		
	Initial Submission					
	a. LC-39 Overall Integrated Processing Schedules (Type 4)	At contract Authority to Proceed (ATP)	No more than one official product a day.			
	b. Detailed Element Level Assessments (Type 3)	10 days prior to LSFR	Per flow basis			
	c. OPF Flow Processing Milestone Schedule (Type 3)	2 weeks prior to LSFR	Per flow basis.			
	d. Flow Integrated Operations Assessment Summary Schedule (Type 1)	2 weeks prior to LSFR	Per flow basis.			
	e. Integrated Test Schedules (Type 3)	First integrated flow after contract award	5 work days prior to Test Call	Contractor produces Integrated Launch and Landing Schedules which are approved by the NASA Launch and	Launch and Landing Schedules reviewed and approved by NASA.	NASA Approval of initial and subsequent submittals
TMR Responsibility Key	Contractor Performance Evidence			NASA Activity	Frequency of NASA Activity	
✓ - Full Responsibility	Data, Reports and/or Metrics generated by the contractor and assessed by NASA to assess performance			NASA activity used to review or assess contractor performance. Proof must be provided that activity was executed.	Frequency required to assess contractor performance (e.g., once per specific flow activity, once per month, etc.).	
GO - Ground Ops Only	First integrated flow after contract award					
MI - Management Insight	First integrated flow after contract award			B-27		

Ground Operations Surveillance Matrix

Responsible Organization Key PH, PH-M1, PH-P, PH-B, OP, TA, Appropriate Org.
PH-M2, PH-F, PH-G, PH-H, PH-J, PH-K

TMR Resp	SOW Section			Contractor Performance Evidence	NASA Activity	Frequency of NASA Activity
	turnaround processing tasks against the as-run schedule performance (Type 4)	contract award		Landing Office.	Gray Book reviewed and approved by NASA.	NASA Approval of initial and subsequent submittals.
	h. Comparison of total predicted resource (direct labor hours) usage for planned work versus actual resources utilized throughout each element and integrated flow and reported in conjunction with the above schedule progress (Type 4)	First integrated or element flow after contract ATP	Biweekly	Included in Gray Book		
	i. Planned versus actual number of days to achieve major program level milestones	First integrated or element flow after contract ATP	Per Flow Basis			
	JSC Flight Operations Schedules Shall cover as a minimum the following activities in addition to the above information:			Included in Gray Book	Gray Book reviewed and approved by NASA.	NASA Approval of initial and subsequent submittals.
	Initial Submission		Frequency			
	Integrated Simulation Schedule	1200 Thursday	Weekly			
	SMS Schedule	10 AM Friday	Weekly			
	SSTF Schedule	10 AM Friday	Weekly			

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Frequency of NASA Activity

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TMR Resp	SOW Section			Contractor Performance Evidence	NASA Activity	Frequency of NASA Activity
	SST Schedule	10 AM Friday	Weekly			
	PTT Schedule	10 AM Friday	Weekly			
	Other Facility Schedules	10 AM Friday	Weekly			
	Crew Training Schedules	10 AM Friday one week prior to training start	Weekly			
	JSC Flight Crew Schedules Shall cover as a minimum the following activities in addition to the above information:					
		Initial Submission	Frequency			
	a. Astronaut Candidate Weekly Schedules	Friday 10 AM or last workday of week	Weekly			
	b. Non-assigned Astronaut Weekly Schedules	Friday 10 AM or last workday of week	Weekly			
	JSC ISS Program Operations Scheduling Products Shall cover as a minimum the following activities in addition to the above information:					
		Initial Submission	Frequency			
	a. Mission Operations Integrated Schedules (including electronic scheduling interfaces)	First month after contract ATP, on the first Monday of month	Monthly			

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TMR Resp	SOW Section			Contractor Performance Evidence	NASA Activity	Frequency of NASA Activity
	to the ISS Program).					
	b. Deliverable dependencies based on facility and product development schedules.	First month after contract ATP, on the first Monday of month	Monthly			
	JSC MOD Flight Management and Schedules Scheduling Products (Data Type 3) Shall cover as a minimum the following activities in addition to the above information:					
		Initial Submission	Frequency			
	a. Mission Operations Shuttle Flight Preparation Schedules	First week after contract ATP	Weekly			
	b. Mission Operations Space Station Flight Preparation Schedules	First month after contract ATP	Monthly			
	13.4 FORMAT : Contractor format is acceptable. 13.5 MAINTENANCE : Changes shall be incorporated as required by change page or complete reissue.					
✓	1. DPD NO. : 821 ISSUE : REV. 1 2. DRD NO. : 1.1.7-c 3. DATA TYPE : 2 4. DATE REVISED : 02/00 5. PAGE : 1/1 6. TITLE : KSC Schedule and Status Summary (Gray Book) 7. DESCRIPTION/USE : To display current KSC schedules and summary information on aspects of the near-term manifest for Shuttle flights.			Contractor produces DR 1.1.7-c KSC Schedule and Status Summary (Gray Book Volumes I and II and the Executive Edition) as specified. Each is reviewed and approved	Review and approve Gray Books.	Initial and all subsequent submittals of the reports are approved.

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Frequency of NASA Activity NASA activity Frequency required to assess contractor performance (e.g., once per specific flow activity, once per month, etc.).

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TMR Resp	SOW Section	Contractor Performance Evidence	NASA Activity	Frequency of NASA Activity
	<p>manifest for Shuttle flights.</p> <p>8. DISTRIBUTION: Per Contracting Officer's letter</p> <p>9. INITIAL SUBMISSION: Assumption of an on-going requirement; no break in existing submission schedule</p> <p>10. SUBMISSION FREQUENCY: Updated as follows: Volume I - Monthly (May be cancelled or replaced by an alternate version of the Grey Book, as requested by NASA-KSC) Executive Edition - Weekly (May be cancelled or replaced by an alternate version of the Grey Book, as requested by NASA-KSC) Volumes II - Quarterly (May be cancelled as requested by NASA-KSC)</p> <p>11. REMARKS:</p> <p>12. INTERRELATIONSHIP: SOW 1.1.7</p> <p>13. DATA PREPARATION INFORMATION:</p> <p>13.1 SCOPE: The KSC Schedule and Status Summary integrates KSC planning of long range hardware, facilities, and other resources to support schedules and manifest.</p> <p>13.2 APPLICABLE DOCUMENTS: NSTS 08178 <i>Space Shuttle Program Schedules</i></p> <p>13.3 CONTENTS:</p> <p>a. Schedule and Status Summary, Volume I Executive Summary--Current planning schedules and summary information for near-term flights, focus on Orbiter and Integrated SSV processing.</p> <p>b. Schedule and Status Summary, Volume I--Same as above, but includes mission processing status, stand-alone element and MLP status, near-term follow-on flights, facility schedules, and as-run data summaries.</p> <p>c. Schedule and Status Summary, Volume II--KSC standard processing factors, assumptions and</p>	by NASA Multi-Flow Integration Manager.		

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TMR Resp	SOW Section	Contractor Performance Evidence	NASA Activity	Frequency of NASA Activity
	<p>other information used for KSC manifest planning support. Also contains schedule enhancement analysis efforts and as-run data summaries.</p> <p>13.4 FORMAT: Contractor format is acceptable with NASA approval.</p> <p>13.5 MAINTENANCE: Changes, as required based on manifest changes, shall be incorporated by change page or complete reissue. The Contractor is encouraged to minimize like documentation and consolidate like planning documentation and processes.</p>			

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TMR Resp	SOW Section	Contractor Performance Evidence	NASA Activity	Frequency of NASA Activity
MI	<p>1.2.1.1 POST FLIGHT ANALYSIS</p> <p>The contractor shall plan, control, and perform all post flight analyses of the actual SSV flight systems. The contractor shall provide the post flight analyses of the SSV to validate engineering preflight prediction tools and methodologies and to provide the SSP visibility on and resolution of in-flight anomalies and anomalous flight history trends. The required analyses include, but are not limited to SSD92D0050, Requirements Definition Document for Post Flight Analysis/Reconstruction. To support flight derived dispersions database updates, DR 1.2.1.1-a will be required.</p>		Support other TMRs as requested	Upon request
MI	<p>1.2.1.1 SOW METRIC</p> <p>Required Service: Completion of all post flight analyses in all technical areas.</p> <p>Standard: All products 100% technically accurate.</p> <p>MER: No errors that require rework of analyses.</p> <p>Standard: All products delivered on or before due date.</p> <p>MER: No major program schedule milestones missed.</p>	Full responsibility resides with the Program Integration TMR. Of the 8 PMS metrics: PI-005, PI-005A, PI-005B, PI-005C, PI-007, PI-007A, PI-007B, & PI-007C, none include Ground Ops data.	Support other TMRs as requested	Upon request

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TMR Resp	SOW Section	Contractor Performance Evidence	NASA Activity	Frequency of NASA Activity
MI	<p>1.3 SAFETY, MISSION ASSURANCE AND PRODUCT ASSURANCE</p> <p>The contractor shall develop, provide, and implement a management system which is certified by third party audit to the requirements of the ISO 9000 series of documents, including ANSI/ASQC Q9001-1994 or equivalent within 18 months of contract award.</p> <p>The contractor shall develop, document and implement the approaches to ensure that all safety and mission assurance (safety, reliability, maintainability, and quality) activities are implemented and are effective in the mitigation of risk for the program, including methods to measure their performance. The contractor shall develop an approach to risk management which integrates safety, reliability, maintainability, and quality issues and correlates those issues with probability of mission success such that the contractor routinely considers risk in day-to-day decision making and is integrated with SOW section 1.1.1.4.</p> <p>The contractor shall develop a plan, including schedule, that demonstrates and measures the transition from the existing contractor/government relationship and responsibilities to the contractor's planned approach to safety and mission assurance for this contract. The plan shall include the approach for increasing the contractor's accountability by translating NASA policy and requirements into auditable plans, system procedures, work instructions and the products produced and services performed for this contract.</p> <p>The contractor shall support government audit/surveillance of contractor plans, procedures, and processes when deemed</p>	<p>Provide third party ISO certification.</p> <p>Developed transition plan, served as co-chair to Transition Management Review Team, partnered transition directives, co-signed transition directives and maintain records.</p>	<p>Third party ISO certification accepted no further action required.</p> <p>Support Reviews as requested by JSC/MA.</p> <p>Served as co-chair to Transition Management Review Team, reviewed and approved transition directives.</p> <p>Performed audit at completion of transition.</p> <p>Schedule and perform audits per Space Shuttle Program Master</p>	<p>Upon receipt of ISO certification</p> <p>As needed</p> <p>As needed</p> <p>Complete</p> <p>As needed</p>

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NASA Activity NASA activity used to review or assess contractor performance. Proof must be provided that activity was executed.

Frequency of NASA Activity Frequency required to assess contractor performance (e.g., once per specific flow activity, once per month, etc.).

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Organization Key

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TMR Resp	SOW Section	Contractor Performance Evidence	NASA Activity	Frequency of NASA Activity
	<p>necessary by the government. These audits/surveillance s will provide understanding and insight of processes and procedures that have been identified as critical, out of control or have the potential for impact to future launch schedules. Government audits/surveillance s will include but are not limited to all disciplines and tasks which are involved with or support Shuttle launch and landing operations, hardware and software production and maintenance, safety and quality assurance, logistics, procurement and financial operations.</p> <p>The following metrics will be used to assist in the evaluation of the contractor performance. All performance metrics will be collected by the contractor unless otherwise stated. Insight metrics will be available to the Government, but will not be assigned standards of excellence, expectations, or maximum error rates.</p> <p>Risk Assessment Metrics:</p>		Audit Schedule as requested for JSC/MA.	
MI	<p>1.3 SOW METRIC #1 (Risk Assessment Performance Metric)</p> <p>This metric will be provided for each of the following risk assessment functions:</p> <ol style="list-style-type: none"> Integration Risk Assessment System Risk Assessment Operations Risk Assessment Nonconformance Risk Assessment <p>Required Service: Contractor to accurately identify and provide information on increased risk to the Government and present to the Government for acceptance.</p>	<p>USA GO S&RE provides increase in risk issues to the government for approval via:</p> <ol style="list-style-type: none"> New Hazard Reports New Cils Updated Hazard Reports that have an increase in risk 	<p>KSC NASA S&MA reviews these documents for compliance with program requirements and provides an approval signature. A NASA-generated metric is reviewed and assessed (CP8-001). Metrics are available on line at http://www-ph.ksc.nasa.gov/PerformanceMetrics/metrics.htm.</p>	Quarterly

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NASA Activity NASA activity

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Frequency of NASA Activity

Frequency required to assess contractor performance (e.g., once per specific flow activity, once per month, etc.).

Ground Operations Surveillance Matrix

Responsible Organization Key PH, PH-M1, PH-P, PH-B, OP, TA, Appropriate Org.
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TMR Resp	SOW Section	Contractor Performance Evidence	NASA Activity	Frequency of NASA Activity
	<p>(Government will collect this metric.)</p> <p>Standard of Excellence: 95% of risk packages presented to the Government are accepted.</p> <p>Expectation: 85% of risk packages presented to the Government are accepted.</p> <p>MER: 80% of risk packages presented to the Government are accepted.</p>	<p>4. Updated Cils that have an increase in risk.</p> <p>5. Waivers to government S&MA requirements</p>		
MI	<p>1.3 SOW METRIC #2 (Risk Assessment Performance Metric)</p> <p>This metric will be provided for each of the following risk assessment functions:</p> <ol style="list-style-type: none"> Integration Risk Assessment System Risk Assessment Operations Risk Assessment Nonconformance Risk Assessment <p>Required Service: Contractor will correctly assess risk and may disposition those items which pose no additional risk to the Government.</p> <p>Standard of Excellence: 95% of items correctly assessed as no increased risk validated through use, Government audit, or Government surveillance.</p> <p>Expectation: 85% of items correctly assessed as no increased risk validated through use, Government audit, or Government surveillance.</p> <p>MER: 80% of items correctly assessed as no increased risk validated through use, Government audit, or Government surveillance.</p>	<p>USA S&MA assess risk and dispositions items posing no additional risk to the government via:</p> <ol style="list-style-type: none"> Routine updates to Hazard Reports Routine updates to CILS System Assurance Analysis Criticality Assessments Waivers to USA S&MA requirements 	<p>A NASA-generated metric is reviewed and assessed (CP8-002). Metrics are available on line at http://www-ph.ksc.nasa.gov/PerformanceMetrics/metrics.htm.</p>	Quarterly
MI	1.3 SOW METRIC #3 (Risk Assessment Insight Metric)			

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NASA Activity NASA activity

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Frequency of NASA Activity

Frequency required to assess contractor performance (e.g., once per specific flow activity, once per month, etc.).

Ground Operations Surveillance Matrix

Responsible
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TMR Resp	SOW Section	Contractor Performance Evidence	NASA Activity	Frequency of NASA Activity
	<p>This metric will be provided for each of the following risk assessment functions:</p> <ul style="list-style-type: none"> a. Integration Risk Assessment b. System Risk Assessment c. Operations Risk Assessment d. Nonconformance Risk Assessment <p>Percent of apparent first time successes through contractor s internal screening process of risk assessments.</p>	<p>Risk Assessment Roll Up-Internal Review First Time Success Rate Description - Percentage of 1st Time USA Internal Review Attempts to Total of USA Internal First Time Review Attempts (by month) Jack Barnette</p>	<p>(ACTION: KSC not currently using. Recommend delete from SOW.)</p>	
MI	<p>1.3 SOW METRIC #4 (Risk Assessment Insight Metric)</p> <p>This metric will be provided for each of the following risk assessment functions:</p> <ul style="list-style-type: none"> a. Integration Risk Assessment b. System Risk Assessment c. Operations Risk Assessment d. Nonconformance Risk Assessment <p>Percent of risk assessment rework that is effective (1-(number of reworked assessments/number of rework attempts))</p>	<p>Risk Assessment Roll Up-Internal Review Rework Rate Description - Percentage of Effective SVR s, CILs, HR s Rework Process Given SVR s, CIL s, HR s Failed USA Internal Review (by month) Jack Barnette</p>	<p>(ACTION: KSC not currently using. Recommend delete from SOW. Note: Metric is a measure of efficiency, not outgoing quality.)</p>	
MI	<p>1.3 SOW METRIC #5 (Assurance Performance Metric)</p> <p>Required Service: Assure that all critical hardware meets inspection requirements. (Government will collect this metric.)</p> <p>Standard of Excellence: 98% of all mandatory Government inspections are accepted.</p> <p>Expectation: 95% of all mandatory Government inspections are accepted.</p> <p>MER: 92% of all mandatory Government inspections are accepted.</p>		<p>Access to data or reports are provided upon request via QSR database.</p>	Continuously
MI	1.3 SOW METRIC #6 (Assurance Performance Metric)	Metric Title Designed		

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Frequency of NASA Activity Frequency required to assess contractor performance (e.g., once per specific flow activity, once per month, etc.).

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TMR Resp	SOW Section	Contractor Performance Evidence	NASA Activity	Frequency of NASA Activity
	<p>Required Service: Assure that all hardware that have designated inspection points meet requirements.</p> <p>Standard of Excellence: Success rate of SFOC work volume greater than 95%.</p> <p>Expectation: Success rate of SFOC work volume greater than 90%.</p> <p>MER: Success rate of SFOC work volume greater than 85%.</p>	<p>Inspection Points for Hardware Number of Inspections Performed/% Accepted</p> <p>Description Total Number of Designated Inspection Points on Hardware that were Inspected. How many were Accepted and Percentage Accepted</p> <p>Jennifer Stenger</p>	<p>Review and assess PMS metric A-GO-105 and A-GO-106. Metrics are available on line at http://www-ph.ksc.nasa.gov/PerformanceMetrics/metrics.htm.</p>	Quarterly
MI	<p>1.3 SOW METRIC #7 (Assurance Insight Metric)</p> <p>Contractor Inspection Acceptance Rate (percent contractor work accepted by contractor inspection)</p>		(ACTION: KSC not currently using. Recommend delete from SOW.)	
MI	<p>1.3 SOW METRIC #8 (Assurance Insight Metric)</p> <p>Ratio of contractor surveillance acceptance rate to NASA surveillance acceptance rate (perfect correlation is 1.0, more or less than 1.0 is less than perfect).</p>		(ACTION: KSC not currently using. Recommend delete from SOW.)	
MI	<p>1.3 SOW METRIC #9 (Safety Assurance Performance Metric)</p> <p>Required Service: Contractor will assure that neither non-SFOC contractor personnel are injured nor NASA property damaged by accidents/incidents during processing.</p> <p>Standard of Excellence: 10 mishaps per year (updated quarterly)</p> <p>Expectation: 15 mishaps per year (updated quarterly)</p> <p>MER: 20 mishaps per year (updated quarterly)</p>		<p>Data provided to NASA HQ via IRIS database.</p> <p>Review and assess PMS metric A-GO-102, Property Damage and A-GO-116, Ground Operations Mishap Rate. Metrics are available on line at http://www-ph.ksc.nasa.gov/PerformanceMetrics/metrics.htm.</p>	<p>Continuously</p> <p>Quarterly</p>

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NASA Activity NASA activity

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TMR Resp	SOW Section	Contractor Performance Evidence	NASA Activity	Frequency of NASA Activity
			ph.ksc.nasa.gov/PerformanceMetrics/metrics.htm .	
MI	1.3 SOW METRIC #10 (Safety Assurance Insight Metric) Ratio of contractor safety surveillance acceptance rate to NASA surveillance acceptance rate (perfect correlation is 1.0, more or less than 1.0 is less than perfect).		(ACTION: KSC not currently using. Recommend delete from SOW.)	
MI	1.3.1 SAFETY The contractor shall develop documented and auditable approaches to achieve safe program operations and assure flight safety. The contractor shall provide support to NASA safety review processes including independent program reviews. The contractor shall review Government Industry Data Exchange Program (GIDEP) Alerts for their applicability to contractor sustained program hardware. For those Alerts having an impact thereto, the contractor shall initiate and disposition a problem report as described in SOW Section 1.3.3.1.	USA provides An Open /Closed Alert Status Report at the FRR - Reported by Joe Hankins. Eunita Bailey is the USA GO GIDEP coordinator.	Support Reviews as requested by JSC/MA. Review GIDEPS alerts, assure no applicable alerts are open and report at LRR	Each LRR
MI	1.3.1.1 SYSTEMS SAFETY The contractor shall develop and implement an approach which ensures the identification, elimination, or control of hazards throughout the complete life cycle (design, development, manufacture, test, operations, maintenance, and disposal) of the program. The approach shall include but not be limited to, analytical methods, both quantitative and qualitative as appropriate (e.g., hazard analyses and Critical Item risk assessments), to assess program flight and ground support hardware and software, facilities and facilities systems and facilitate the decision process for risk	USA S&RE have SPI s that require their support to the design and development process. The products delivered are the CILS and Hazards.	Chair Risk Review Board and accept changes. Participate in PRCBs. Review/Approve Out-of-Family dispositions per KDP-P-1689.	As needed Each occurrence

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TMR Resp	SOW Section	Contractor Performance Evidence	NASA Activity	Frequency of NASA Activity
	identification and mitigation; provisions for the program approval, by the appropriate government interface, of risk associated with hazards and critical items not eliminated by design; and program approval, by the appropriate government interface, of exceptions, deviations or waivers from safety requirements or other requirements with safety or mission success impact. The approach and results shall be documented by the contractor and auditable by the government.			
MI	<p>1.3.1.2 OPERATIONS SAFETY</p> <p>The contractor shall develop and implement an approach in which testing, flight and ground operations and maintenance activities are assessed for hazards and the process which NASA and other non-contractor personnel and property will be protected from injury or harm as a result of exposure to these hazards. The approach shall include flight design and procedurally controlled activities. The risk assessment of operations or task performed by persons and equipment and considers (1) the planned system configurations at each phase of activity; (2) the facility interfaces; (3) the planned ground and space environment; (4) the supporting equipment; (5) task sequence; (6) the regulatory safety and health requirements; and (7) the potential for human error. The contractor shall report and investigate accidents resulting in damage to NASA property or injuries to NASA or other non-contractor personnel, to include assessments of accident impacts to cost, schedule and mission performance, and remedial and corrective actions performed. The approach shall cover operations both by the contractor and by other government and non-government organizations within operational facilities controlled by the contractor. The approach shall include provisions for program approval, by the appropriate government interface, of risk associated with</p>	Provide GSOP.	<p>Chair Risk Review Board and accept changes. Participate in PRCBs.</p> <p>On distribution to waivers and exceptions to GSOP. Intervene by exception.</p>	<p>As needed</p> <p>As needed</p>

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TMR Resp	SOW Section	Contractor Performance Evidence	NASA Activity	Frequency of NASA Activity
	<p>hazards not eliminated or controlled. The approach and results shall be documented by the contractor and auditable by the Government.</p> <p>The contractor is responsible for assuring the SSP Hazard Report Configuration Management process conforms to NSTS 22254. This task includes tracking of Hazard Report revisions, closure classification, risk changes, and baseline counts; and Program Compliance Assurance and Status System (PCASS) verification.</p> <p>The contractor shall provide summary data on accidents (DR 1.3.1.2-b).</p> <p>The contractor shall support the NASA Managed Safety Program for Pressure Vessels and Pressure Systems in accordance with NMI 1710.3, NHB 1700.6, KHB 1710.15, JHB 1710, MHB 1710.10, & NASA/SSC Operations Procedure 83-1 (DR 1.3.1.2-c).</p>		<p>Chair Risk Review Board and accept changes. Participate in PRCBs. Member SSRP.</p> <p>Data provided through IRIS database.</p> <p>NASA has a joint NASA contractor team to review all contractor recertifications</p>	<p>As needed</p> <p>Continuous</p> <p>All pressure systems recertified every 5 years</p>
MI	<p>1.3.2 RELIABILITY AND MAINTAINABILITY</p> <p>The contractor shall develop and implement an approach in which the availability objectives of the program will be achieved. The approach will include but not be limited to, assessments of reliability and maintainability performance against baseline allocations; preparation, maintenance, and control of reliability assessments such as Failure Modes and Effects Analyses and assessments of materials and parts in support of operational integrity. Reliability assessments shall identify critical items and the operational impacts of hardware failure modes. The approach shall be documented by the contractor and auditable by the government.</p> <p>The contractor is responsible for managing and publishing all</p>		<p>Chair Risk Review Board and accept changes. Participate in PRCBs. Member SSRP.</p> <p>Review and assess NASA-generated metrics CP8-001 and CP8-002. Metrics are available on line at http://www-ph.ksc.nasa.gov/PerformanceMetrics/metrics.htm.</p>	<p>As Needed</p> <p>Quarterly</p>

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	<p>approved FMEA/CILs which are submitted to the Space Shuttle Program (SSP) per NSTS 07700, Volume V, Information Management Requirements, IR 2SR-22, CIL, IR 2SR-23 CHL, and NSTS 22206, Space Shuttle Requirements for Preparation and Approval of FMEA/CIL in accordance with NSTS 08399, SSP Critical Items List and Critical Hardware List.</p> <p>The contractor shall support program development efforts, as required, to develop system reliability, availability, and maintainability requirements and assess the designs to assure that the requirements are met.</p>			
MI	<p>1.3.3 QUALITY ASSURANCE</p> <p>The contractor shall develop and implement an approach which describes the establishment and maintenance of a quality management system as specified in SOW section 1.3. The approach shall include methods for the establishment of quality goals and performance measurement and shall be documented by the contractor and auditable by the government.</p>		Support Reviews as requested by JSC/MA.	As needed
MI	<p>1.3.3.1 PRODUCT AND SERVICE QUALITY</p> <p>The contractor shall collect and compile information derived from empirical data (test results, analysis reports, inspection records, delivery logs, etc.) to demonstrate that the products and services delivered to the government are in compliance with the requirements and specifications as specified in this contract. The delivery of the compliance information shall be at the request of the government, either specifically through this contract or on request of the appropriate government interface.</p> <p>The contractor shall provide and maintain, for those items</p>	Provide the following SOW and PMS metrics: A-GO-115, USA Ground Operations IFA Rate; A-GO-103, SFOC Work Performance Error Rate, A-GO-105, SFOC Inspection Work Performance Error Rate.	<p>Review and assess metrics.</p> <p>NASA signs DD250s and USA</p>	<p>Quarterly</p> <p>As needed</p>

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	<p>that the contractor has custody, an Acceptance Data Package in accordance with SN-S-0008, SN-C-0007, and SSP 30695 (DR 1.3.3.1) for HW/SW delivery or transfer to the government.</p> <p>The contractor shall provide for the identification, reporting, and elimination/disposition of non-conformance s/problems/anomalies/failure analysis in accordance with NSTS 07700 and NSTS 08126; or SSP 30223 Problem Reporting and Corrective Action (PRACA) requirements, as appropriate, including recording anomalous system performance and material conditions identified, providing rationale for resolution, the remedial action performed, the recurrence control and corrective actions taken to preclude recurrence, and determining the effectiveness of corrective actions. The contractor shall provide access to PRACA documentation, data, databases, analysis, and related information to the government. The contractor shall create and sustain an open communication with employees and subcontractors to identify, track, and resolve non-conformance s/ problems/ anomalies including close calls. The contractor shall have a data system that allows NASA real time access to this problem data. Initially, the contractor shall use the existing PRACA system, but may propose improvements to the system or an alternate system and a transition from PRACA. The contractor shall provide for appropriate government insight, into the disposition of nonconformances/ problems/anomalies, including notifying the government of the occurrence and, as appropriate, obtaining government approval of the disposition as specified in SOW 1.1.1.4. The contractor shall initiate (including requesting government approval) action to change or eliminate requirements that non-conformance data analysis indicates are unreasonable or unnecessary, and to improve</p>	<p>USA provides access to PRACA data.</p> <p>Generate PMS Mishap Metric, A-GO-116.</p> <p>USA uses PRACA system and provides data to the program via the PRACA database.</p> <p>Provide PMS</p>	<p>maintains records.</p> <p>Accept third party ISO certification.</p> <p>Perform GMIPs in accordance with QPRD.</p> <p>Review and assess PMS Mishap Metric, A-GO-116. Metrics are available on line at http://www-ph.ksc.nasa.gov/PerformanceMetrics/metrics.htm. Review/approve per Insight plan, KPH-010 and SPI s</p>	<p>Complete</p> <p>As needed</p> <p>Quarterly</p> <p>Continuous</p>

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	or change processes which produce products or services that fail to meet requirements.			
MI	<p>1.3.3.2 PROCESS QUALITY</p> <p>The contractor shall identify those fabrication, assembly, integration, and management processes which control key product characteristics. Key characteristics are the features of a material, part, or process whose variation has a controlling influence on product fit, service life, or performance, including safety or reliability. The contractor shall measure, verify, and control the variability and stability of these processes. The contractor shall manage the Orbiter and Cargo Integration Certification Process associated with the certification of Contractor Furnished Equipment (CFE), including operating and maintaining a Certification Library.</p> <p>The contractor shall, as requested, provide data or access to data, on product and service production processes. The data shall provide insight into product and service cost characteristics of product or service components; product and service component delivery or receipt schedules; and product and service component quality, including workmanship errors and rework. The government may request this data, or access to the data, on a continuous basis for critical processes or may request data, or access to data, based on product cost, schedule, or quality trends. For the processes designated as critical, the contractor shall document and propose auditable approaches to collect, compile, analyze, and report the data that provides government insight into the process.</p>	<p>Integrated Logistics A-IL-030 First Time Quality</p> <p>Integrated Logistics provides data or access to data upon request</p>		

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✓	<p>1.4 FLIGHT ELEMENTS</p> <p>General Processing Requirements</p> <p>Flight element processing consists of all testing and maintenance (planned and unplanned) required to verify flight element system condition and performance is within specified limits and to ready the flight element for integrated processing in preparation for launch. Integrated processing consists of all testing and maintenance required to bring the flight elements together ready for launch. The transition from integrated processing to flight element processing is at the last operation after element de-integration (e.g., Orbiter wheel stop in the Orbiter Processing Facility [OPF] or Mate Demate Device at Dryden Flight Research Center [DFRC], SRB/RSRM ready for shipment after disassembly).</p> <p>The contractor shall develop and maintain procedures (DR 1.4-a). The contractor shall perform all flight element processing activities in accordance with approved work authorization documents to assure that these elements operate within all the design specifications, drawings, and OMRS. Procedure development and distribution metric is covered in SOW Section 1.5.</p>	<p>Assess quarterly:</p> <ul style="list-style-type: none"> USA GO PR rate (GO-112) USA GO on-time launch attempt percent (GO-113) USA GO on-time processing (GO-114) USA GO induced IFAs (GO-115) <p>See Section 1.5 The following critical SFOC SPIs which define aspects of flight element process are approved by NASA: SP-004: Work Area Rules and Access Controls for SSV and Associated Processing Areas SP-005: Control of Flight-Critical Moving and Handling Operations SP-009: Tool Control Program</p>	<p>Review and assess PMS Mishap Metrics, GO-112, GO-113, GO-114, GO-115. Metrics are available on line at http://www-ph.ksc.nasa.gov/PerformanceMetrics/metrics.htm.</p> <p>See Section 1.5</p>	<p>Quarterly</p> <p>NASA approval for initial submittal and subsequent revisions.</p>

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	<p>The contractor shall provide Safety, Mission Assurance and Product Assurance for all element hardware and software as defined in SOW section 1.3.</p> <p>The contractor shall implement the planning and control and perform contingency operations that may arise during the flight element s processing to support unplanned program contingencies (e.g., hurricanes, launch abort/turnarounds, etc.) as identified in SOW Section 1.1.1.1 and Exhibit 1.1.1.1.</p> <p>The contractor shall report and resolve anomalies in compliance with NSTS 07700 and NSTS 08126, or SSP 30223 PRACA Requirements, as specified in SOW section 1.3. The contractor shall refer to SOW section 1.1.1.4 for out of family anomaly reporting requirements.</p>	<p>The following metrics provide an indication of the quality of flight element processing for each flow.</p> <p>PMS Metric GO-117: USA Ground Operations Workmanship PR Rate PMS Metric GO-118: USA Ground Operations Lost and Found (LAF) PR Rate</p> <p>Per approved procedures:</p> <p>PRACA</p> <p>SPI s</p> <p>The Contractor produces the following Contingency Plans</p>	<p>Provide NASA assessment. Metrics are available on line at http://www-ph.ksc.nasa.gov/PerformanceMetrics/metrics.htm.</p> <p>Review/approve per Insight plan, KPH-010 and SPI s and KPH-1689</p> <p>Review/Approve Out of Family dispositions as defined per SPI and KPD-P-1689 and Insight plan KPH-010</p> <p>Review/approve per Insight plan, KPH-010 and SPI s and KPH-1689</p>	<p>Quarterly</p> <p>Continuous</p> <p>Continuous</p> <p>As needed</p> <p>Weekly</p>

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		<p>which are reviewed and approved by NASA:</p> <ol style="list-style-type: none"> 1. K-STSM-09.3.01 STS Ops Plan Flight & Ground Crew Rescue 2. K-STSM-09.3.02 KSC Shuttle Data Impoundment & Handling Plan 3. KVT-PL-0004 Ops Plan for STS Emergency Egress System 4. KVT-PL-0008 Ops Plan for Post Cryo Loading Pad Access 5. S0007 Vol. 5, SSV Launch Countdown Procedure 6. S0038 SSV Preparations for Rollback to the VAB 7. EPD S9906 EAFB/DFRC Shuttle Landing Site EPD 8. EPD S9907 Non-CONUS CLS EPD 9. EPD S9925 Shuttle Backup Landing Site EPD 	PMRB rep/chair as defined in NSTS 07700 Vol	

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TMR Resp	SOW Section	Contractor Performance Evidence	NASA Activity	Frequency of NASA Activity
	<p>The contractor shall develop troubleshooting and analysis plans, repair dispositions, and acceptance rationale. The contractor shall perform troubleshooting, analysis, repair, retest, failure analysis, corrective action, trend analysis and follow-up to determine effectiveness of corrective actions. The contractor may perform approved standard repair procedures, repairs which restore hardware to specification, and hardware removal and replacement in accordance with SOW section 1.1.1.4.</p> <p>The contractor shall ensure all Government and contractor personnel are properly trained or certified, as required, by providing required training or certification before participation in operations or in work areas.</p>	<p>(WSSH, NM)</p> <p>10. KVT-PL-0014 KSC Off-site Operations Plan</p> <p>11. KVT-PL-0015 Convoy Operations Plan</p> <p>12. KVT-PL-0021 NSTS Salvage Plan</p> <p>13. KPH-HB-1040.1 PH Emergency Preparedness/Hurricane Plan</p> <p>BM-001 Dictates how SPIs are to be written and references the SPIs requiring NASA Approval in the SPI Index. The following list of SPIs address working paper: SP-518(2)K Category II UTOPS; SP-511(2)K Deviation; QA-020(3)K Deviation/Waiver Requests; SP-634(2)K FEC (ET, SRB, RSRM); SP-609(2)K Followup EO s/DCN s; SP-604(2)K Intrusive electrical work on</p>		

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		<p>Shuttle Flight Systems; SP-509(2)K Job Card; QA-019(3)K MRB / PMRB; SP-519(2)K OMI; SP-603(2)K OMRS changes; SP-508(2)K Pen-and-ink changes, WADs; QA-001(3)K PRACA; SP-504(2)K TPS; QA-002(3)K TPS PRACA;</p> <p>All USA Technical Training is entered in the NASA-owned Training Certification Record System (TRCS). Employees must have Cert card to perform tasks requiring certification.</p>		
	<p>1. DPD NO.: 821 ISSUE: BASIC 2. DRD NO.: 1.4-a 3. DATA TYPE: 1 4. DATE REVISED: 05/27/97 5. PAGE: 1/1 6. TITLE: KSC Work Authorization Documents (Category 1) Development and Maintenance Plan 7. DESCRIPTION/USE: To define and document standardized processes, formats, and responsibilities required for developing, maintaining, approving, and changing KSC Work Authorization Documents (WAD's). 8. DISTRIBUTION: Per Contracting Officer's letter 9. INITIAL SUBMISSION: Assumption of an on-going</p>	SPI s	Review/approve per SPI s	

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	<p>requirement; no break in existing submission schedule</p> <p>10. SUBMISSION FREQUENCY: Submission of each WAD will be established in accordance with the approval of the Operations and Maintenance Documentation (OMD) Control Board and will be revised in accordance with the approved WAD change processes and plans.</p> <p>11. REMARKS: NAS10-10900, DRL items 13, 33, and 34</p> <p>12. INTERRELATIONSHIP: SOW 1.4 and 1.5</p> <p>13. DATA PREPARATION INFORMATION:</p> <p>13.1 SCOPE: The KSC Work Authorization Documents (Category 1) Development and Maintenance Plan shall define contractor responsibilities for the development and maintenance of Category 1 Shuttle processing procedures.</p> <p>13.2 APPLICABLE DOCUMENTS: S00000-2, File 1 <i>Technical</i> <i>Operations</i> <i>Procedure Preparation Handbook</i> KMI 1710.12 <i>Technical</i> <i>Operation</i> <i>Procedures Policy</i> KVT-HB-0002 <i>OIS Call Sign/Word Handbook</i></p> <p>13.3 CONTENTS: The KSC Work Authorization Documents (Category 1) Development and Maintenance Plan shall:</p> <p>a. Describe the standardized approach to maintain, update, and control the configuration of existing and future WAD's (as a minimum Category 1) required for each planned flight hardware turnaround activity, as well as for support equipment for which the contractor has O&M responsibility in accordance with S00000-2, File 1.</p> <p>b. Define how Operational Intercommunication System (OIS) call signs and call words will be used during operational Shuttle processing. This approach shall</p>			

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	cover the scope and content of the existing OIS Call Sign/Word Handbook (KVT-HB-0002). 13.4 FORMAT: Contractor shall conform to delivery media formats and electronic data formats per DRD 1.1.4.1-e, Data Management Plan, or per Contracting Officer approval. 13.5 MAINTENANCE: Revision level and date.			
MI	1.4.1.1 MISSION AND TURNAROUND REQUIREMENTS The contractor shall perform mission and vehicle compatibility analyses in preparation for flight support and provide real-time mission execution engineering support. The contractor shall evaluate Orbiter system performance from the start of launch countdown through completion of the postlanding checklist and crew egress to verify Orbiter hardware and system performance is as expected, and to provide assessments for go/no-go launch decisions to the Government. The contractor shall evaluate prelaunch and in-flight anomalies, provide assessments of the systems ability to safely launch and complete mission objectives, and provide pre-launch or in-flight corrective, remedial, or contingency action recommendations including in-flight maintenance or changes to the flight plan or crew procedures to the Government. The contractor shall retain in-flight checkout data for all completed flights and provide access to NASA. The contractor shall evaluate all documented Orbiter flight verification requirements performed during flight operations and report all requirements not accomplished to NASA. The contractor shall identify, document and provide NASA with access to all out-of-specification flight verification results. The contractor shall provide systems engineering to sustain operational performance validation, anomaly resolution, corrective action disposition and mission analysis efforts as required to support the certificate of flight			

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	<p>readiness.</p> <p>The contractor shall coordinate facility, communications and telemetry requirements for flight operations support activities conducted at NASA s flight operations support sites with NASA. The contractor may support flight operations from remote sites.</p> <p>The contractor shall provide accurate Orbiter vehicle configuration engineering and verification requirements for each flight as required to support the mission manifest. The contractor shall establish and document Orbiter turnaround maintenance requirements and specifications (DR 1.4.1.1.3-a). The contractor shall submit changes to the JSC 08934 Shuttle Operational Data Book (DR 1.4.1.6.1-a). The contractor shall analyze Orbiter vehicle configuration, mass properties, certification status, and anomaly dispositions (DR 1.4.1.6.1-d) to determine whether the requirements for each pending mission have been complied with. The contractor shall prepare or evaluate launch commit criteria and flight rule changes. The contractor shall prepare vehicle configuration and measurement information (DR s 1.4.1.6.1-f and 1.4.1.6.1-g) for launch and flight support. The contractor shall provide Orbiter engineering and technical support for the Orbiter processing operations identified in SOW paragraphs 1.4.1.2, 1.4.1.3, 1.4.1.4, and 1.5. These activities shall encompass vehicle subsystems, including the Waste Collection System.</p>	<p>ERS</p> <p>PMS Metric A-GO-001</p> <p>PRACA</p> <p>LCC document</p> <p>Approved procedures</p>	<p>NASA signature required on ERS as defined per SPI SP-507</p> <p>Reviewed during NASA internal CoFR process per Insight plan (PE CoFR)</p> <p>Review/approve per Insight plan, KPH-010 and SPI s and KPH-1689</p> <p>Review/approve per Insight plan, KPH-010 and SPI s and KPH-1689</p>	<p>Per flow</p> <p>Per flow</p> <p>Continuous</p> <p>Continuous</p>
MI	<p>1.4.1.1 SOW METRIC</p> <p>Required Service : Obtain timely product deliveries from the Orbiter Element Subcontractor.</p> <p>Standard: A score of 105% or better for the product delivery metric.</p>		Support Orbiter TMR upon request	As required

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Ground Operations Surveillance Matrix

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PH-M2, PH-F, PH-G, PH-H, PH-J, PH-K

TMR Resp	SOW Section	Contractor Performance Evidence	NASA Activity	Frequency of NASA Activity
	<p>Expectation: A score of 97% or better for the product delivery metric.</p> <p>MER: A score of 90% or better for the product delivery metric.</p> <p>The product delivery metric is computed by initializing the metric at 100%, then adjusting as follows :</p> <p>Adding 1% for each product delivered 1-5 days early.</p> <p>Adding 2% for each product delivered 6 or more days early.</p> <p>Subtracting 2% for each product delivered 1-5 days late.</p> <p>Subtracting 4% for each product delivered 6 or more days late.</p> <p>Any product defined as a DRD in the subcontract is considered a product for computing the metric. As required products are considered on time when delivered.</p>			
✓	<p>1.4.1.3 ORBITER TURNAROUND PROCESSING</p> <p>The contractor shall plan, control and perform all turn around processing activities in a manner consistent with SOW section 1.4 for hardware accountability and general processing requirements. The contractor shall prepare the Orbiter for flight, including special action requirements (DR 1.4.1.1.2-a) and support for integrated operations as specified in SOW section 1.5. This shall include off-line turnaround processing of LRU s. The contractor shall accomplish all documented Orbiter ground turnaround configuration and verification requirements and report all requirements not accomplished to NASA. The contractor shall identify, document and provide NASA with access to all out-of-specification turnaround verification results. The contractor shall assess, plan, prepare, and execute modification and mission kit installation work authorization documents and conduct subsystem and system verification testing.</p>	<p>See entries for paragraphs 1.4 and 1.5.</p> <p>PMS Metrics GO-123, GO-124, A-GO-001</p> <p>Engr. Req. Satis. (ERS)</p>	<p>See entries for paragraphs 1.4 and 1.5.</p> <p>Reviewed during NASA internal CoFR process per Insight plan KPH-010 (PE CoFR)</p> <p>NASA signature required on ERS as defined per SPI SP-507</p>	<p>See entries for paragraphs 1.4 and 1.5.</p> <p>Per flow</p> <p>Per flow</p>

TMR Responsibility Key

- ✓ - Full Responsibility
- GO - Ground Ops Only
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Contractor Performance Evidence

Data, Reports and/or Metrics generated by the contractor and used by NASA to assess performance (proof of performance required).

NASA Activity NASA activity used to review or assess contractor performance. Proof must be provided that activity was executed.

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Frequency of NASA Activity Frequency required to assess contractor performance (e.g., once per specific flow activity, once per month, etc.).

Ground Operations Surveillance Matrix

Responsible
Organization Key

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TMR Resp	SOW Section	Contractor Performance Evidence	NASA Activity	Frequency of NASA Activity
✓	<p>1.4.1.3 SOW METRIC</p> <p>Required Service: Verification of vehicle and systems performance readiness.</p> <p>Standard: All ground verification requirements completed or dispositioned through appropriate NASA forums.</p> <p>Expectation: No processing operations executed without properly completed or dispositioned verification of pre-requisite requirements.</p> <p>MER: No processing operations executed without properly completed or dispositioned verification of pre-requisite requirements.</p>	PMS Metrics A-GO-001	Assess metric for award fee evaluation	Quarterly
✓	<p>1.4.1.4 ORBITER FERRY OPERATIONS</p> <p>The contractor shall plan, control, and perform operations required to prepare and ferry the Orbiter. These processing tasks include the planned and unplanned work performed on the Orbiter, and integration with the government-provided Shuttle Carrier Aircraft (SCA) in the Mate/Demate Device (MDD) or other lifting fixtures/devices required to prepare the vehicle and disposition anomalies for ferry flight. These processing tasks shall include routine, planned and unplanned processing and maintenance operations and verification procedures which determine the operational status and condition of the flight element s systems prior to ferry flight. Also included are the ground support operations performed at intermediate stopovers. If the Orbiter is ferried to or from the OMDP site, the contractor shall perform pre-ferry deservicing preparations and post-ferry reconfiguration activities encountered during OMDP.</p>	Approved procedures	<p>Review/approve per Insight plan, KPH-010 and SPI s and KPH-1689</p> <p>Joint NASA and Contractor participation in Milestone reviews per KPD 8630.3.</p>	<p>Continuous</p> <p>Each milestone</p>
MI	1.4.1.5.2 HARDWARE, MODIFICATIONS, AND			

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TMR Resp	SOW Section	Contractor Performance Evidence	NASA Activity	Frequency of NASA Activity
	<p>SUPPORT</p> <p>The effort defined herein shall be specifically authorized under the Program Provision Procedure as defined in Schedule Article H.35, entitled Program Provisioning. The contractor shall provide engineering design capability to accomplish any necessary changes required to preserve original design requirements compatibility and certification, and to support assessment of new capability developments as might be initiated by NASA. The contractor shall perform operational and implementation impact assessments of all proposed or approved Orbiter (hardware/software) design changes.</p> <p>The contractor shall design, develop, produce, verify and deliver certified Orbiter hardware, Orbiter hardware mission kits embedded software, and system modifications (DR s 1.4.1.5.1-a, 1.4.1.5.1-b, and 1.4.1.5.1-c). The contractor shall produce engineering drawings and associated lists, configuration documentation, performance verification requirements and specifications, and acceptance data packages (DR 1.3.3.1) for the mission and modification kits that comply with the Orbiter Vehicle End Item Specification, MJ070-0001-1D. The contractor shall produce and submit Orbiter engineering design (DR 1.4.1.1.1-b) and specification (DR 1.4.1.1.1-c) changes for approval. The contractor shall control and track all Orbiter materials (DR 1.4.1.1.1-d).</p> <p>This task also includes the support required to manage and maintain production assets.</p>		NASA signs Out of Family procedures that implement new design modifications and any TPS/PR EO-to-follow that are a result of design deficiencies	As needed
MI	<p>1.4.1.5.2 SOW METRIC</p> <p>Required Service: Ensure vehicle modification product</p>		Support Orbiter TMR on request	As required

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Frequency of NASA Activity Frequency required to assess contractor performance (e.g., once per specific flow activity, once per month, etc.).

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TMR Resp	SOW Section	Contractor Performance Evidence	NASA Activity	Frequency of NASA Activity
	<p>Standard: quality Product assurance (inspection) verification of hardware attributes during manufacturing as reported in the product quality report (non-conformance s per 1000 direct labor hours) shall be no more than 3.0/KDLH.</p> <p>Expectation: Product assurance (inspection) verification of hardware attributes during manufacturing as reported in the product quality report (non-conformance s per 1000 direct labor hours) shall be no more than 4.5/KDLH.</p> <p>MER: Product assurance (inspection) verification of hardware attributes during manufacturing as reported in the product quality report (non-conformance s per 1000 direct labor hours) shall be no more than 6.0/KDLH.</p>			
GO	<p>1.4.1.5.3 ORBITER OMDP</p> <p>The contractor shall perform operational impact assessments of Orbiter design changes, prepare the work authorization documents, install the changes during Orbiter Maintenance Down Periods (OMDP), and conduct subsystem testing. The contractor shall assess, perform and validate modifications; kit installations and Special Action Requests (SAR). The contractor shall plan and perform inspections and verification testing specified for accomplishment during OMDP. Each OMDP will be added via a separate contractual action</p> <p>The work required for the OV-105 OMDP is included in the SFOC as defined by the latest Program Requirements</p>	Approved procedures (OMS pods only)	Review/approve per Insight plan, KPH-010 and SPI s and KPH-1689	Continuous

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NASA Activity NASA activity used to review or assess contractor performance. Proof must be provided that activity was executed.

Frequency of NASA Activity Frequency required to assess contractor performance (e.g., once per specific flow activity, once per month, etc.).

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TMR Resp	SOW Section	Contractor Performance Evidence	NASA Activity	Frequency of NASA Activity
	Control Board Directive (PRCBD) S063115HR7 which baselines mods performed during OMDP for OV-105. The work required for the OV-104 OMDP is included in the SFOC as a result of Modification 271 and as defined by the latest Program Requirements Control Board Directive (PRCBD) S063124DR5 which baselines mods performed during OMDP for OV-104.			
MI	1.4.1.5.4 ORBITER/EXTERNAL TANK UMBILICALS The contractor shall develop, produce, and deliver Orbiter/External Tank umbilicals. The delivery schedule for the Orbiter/External Tanks umbilical disconnects LO2/LH2 ship sets is listed in contract Attachment J-20.		NASA signs Out of Family procedures and any TPS/PR EO-to-follow that are a result of design deficiencies or discrepant hardware.	As needed
MI	1.4.1.5.4 SOW METRIC #1 Required Service: Provide ET umbilicals. Standard: All ET umbilicals delivered by the negotiated delivery date. Expectation: No more than 1 ET umbilical shipset delivered more than 15 days after the negotiated delivery date. MER: No more than 1 ET umbilical shipset delivered more than 30 days after the negotiated delivery date.		Support Orbiter TMR	As required
MI	1.4.1.5.4 SOW METRIC #2 Required Service: ET umbilical product quality. Standard: Product assurance (inspection) verification of hardware attributes during manufacturing as reported in the product quality report (non-conformance s per 1000 direct labor hours) shall be no more		Support Orbiter TMR	As required

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NASA Activity NASA activity used to review or assess contractor performance. Proof must be provided that activity was executed.

Frequency of NASA Activity Frequency required to assess contractor performance (e.g., once per specific flow activity, once per month, etc.).

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TMR Resp	SOW Section	Contractor Performance Evidence	NASA Activity	Frequency of NASA Activity
	<p>Expectation: than 4.0/KDLH. Product assurance (inspection) verification of hardware attributes during manufacturing as reported in the product quality report (non-conformance s per 1000 direct labor hours) shall be no more than 5.5/KDLH.</p> <p>MER: Product assurance (inspection) verification of hardware attributes during manufacturing as reported in the product quality report (non-conformance s per 1000 direct labor hours) shall be no more than 7.0/KDLH.</p>			
✓	<p>1.4.2.1 SRB ELEMENT PROCESSING</p> <p>The contractor shall perform SRB processing using hardware and the associated certified documentation. The contractor shall perform all processing activities associated with the SRB hardware in support of the integrated operations phase of the STS as specified in SOW section 1.5. The contractor shall support acceptance reviews, test requirements, stacking, anomaly resolution and deviations/waivers. The contractor shall perform processing impact assessments, process requirements, install, validate and test modification kits. DRD s: 1.4.2.1-a, 1.4.2.1-b, 1.4.2.1-c, 1.4.2.1-d, and 1.4.2.1-f</p>	<p>Approved procedures</p> <p>Engr. Req. Satis (ERS)</p> <p>PMS metric GO-124</p> <p>See entries for paragraphs 1.4 and 1.5.</p>	<p>Review/approve per Insight plan, KPH-010 and SPI s and KPH-1689</p> <p>NASA signature required on ERS as defined per SPI SP-507</p> <p>Reviewed during NASA internal CoFR process per Insight plan KPH-010 (PE CoFR)</p> <p>See entries for paragraphs 1.4 and 1.5.</p>	<p>Continuous</p> <p>Per flow</p> <p>Per flow</p> <p>See entries for paragraphs 1.4 and 1.5.</p>
✓	<p>1.4.2.6 SRB ELEMENT PROCESSING, GROUND SYSTEMS DESIGN RESPONSIBILITY</p> <p>The contractor shall perform sustaining engineering for SRB facilities, facility systems, and Ground Support Equipment (GSE), which are used to support SRB Element Processing.</p>		<p>Review/approve per Insight plan, KPH-010 and SPI s and KPH-1689</p>	<p>As needed</p>

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TMR Resp	SOW Section	Contractor Performance Evidence	NASA Activity	Frequency of NASA Activity
	This sustaining engineering support shall be provided in accordance with the requirements of SOW paragraph 1.5			
✓	<p>1.4.2.8 SRB RECOVERY OPERATIONS</p> <p>The contractor shall support integrated operations as identified in SOW section 1.5.4.4.</p>		NASA system engineer is a member on post flight assessment team and review/approve any Out of Family related to hardware anomalies	As needed
GO	<p>1.4.2.10 SRB MODIFICATIONS</p> <p>The element contractor shall provide SRB modification kits required for ground processing to support the operations phase of the STS. The contractor shall perform operational impact assessments, process requirements, install, validate and test modification kits.</p>		NASA signs Out of Family procedures that implement new design modifications and any TPS/PR EO-to-follow that are a result of design deficiencies	As needed
MI	<p>1.4.3.1 ORBITER AND BFS FLIGHT SOFTWARE PROCESSING AND TOOLS</p> <p>The contractor shall provide development and maintenance of individual software packages and integrated software systems necessary to provide for avionics flight software (FSW) development, certification, reconfiguration, testing, and verification in accordance with the current baseline process (SCR 89057-Flight Software Application Tools [FSWAT] Process). The contractor shall develop and maintain all FSW application tools unique to the development, reconfiguration, and maintenance of the Shuttle onboard BFS FSW. DR s associated with this activity are: DR 1.4.3.1-a, 1.4.3.1-b, and 1.4.3.1-c.</p> <p>The contractor shall maintain configuration control of all FSW products delivered to NASA. Configuration control shall</p>			

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Frequency of NASA Activity Frequency required to assess contractor performance (e.g., once per specific flow activity, once per month, etc.).

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TMR Resp	SOW Section	Contractor Performance Evidence	NASA Activity	Frequency of NASA Activity
	<p>provide full traceability from NASA approved requirements to the individual items delivered and shall be applied to each operational increment (OI) or Shuttle FSW build. The contractor shall utilize a configuration management database to support the configuration control and coordination of the contractor and NASA boards. This support shall include report generation, configuration audits, control board administration, and control documentation. The DR s associated with this activity are: DR 1.4.3.1-d, and 1.4.3.1-g.</p> <p>The contractor shall support computer access security, data integrity, implementation, test, and maintenance of the Software Development Facility (SDF) for all coding of BFS and FSW application tools. The overall computer security and data integrity requirements shall be consistent with the Automated Information System Security Manual (JSC-2410.11).</p> <p>The contractor shall maintain the MAST database including definition and incorporation of hardware component calibration coefficients and curves, measurement channelization, and telemetry format requirements in accordance with current baseline process CR 89053-MAST II/STAR Reconfiguration. The Contractor shall resolve payload data interleaver compiler bandwidth and instruction issues encountered as a result of SSV hardware modifications. The contractor shall provide a help desk capability to facilitate user interaction. DR s associated with this activity are: DR 1.4.3.1-k, 1.4.3.1-n, and 1.4.3.1-q.</p> <p>The contractor shall be provided GFE flight software products, perform pre-installation processing, install as a total or partial load and perform memory dumps and compares to ensure proper installation. Included is the assessment of the</p>	Approved procedures	Review/approve per Insight plan, KPH-010 and SPI s and KPH-1689	Continuous

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Contractor Performance Evidence

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NASA Activity NASA activity used to review or assess contractor performance. Proof must be provided that activity was executed.

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Frequency of NASA Activity Frequency required to assess contractor performance (e.g., once per specific flow activity, once per month, etc.).

Ground Operations Surveillance Matrix

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TMR Resp	SOW Section	Contractor Performance Evidence	NASA Activity	Frequency of NASA Activity
	software delivery to determine any GOAL application/procedure impacts and the provisions of test support and procedure execution.			
MI	<p>1.4.3.1 SOW METRIC</p> <p>Required Service: Provide BFS Software Approval Sheet (SAS) and test patches.</p> <p>Standard: Released software patches are 100% technically accurate, complete in content and delivered on the negotiated schedules.</p> <p>Expectation: Slips or redelivery caused by BFS not meeting negotiated schedules or due to a redelivery to correct an error are allowed if no additional resource impact to outside organizations is incurred.</p> <p>MER: No errors in released test patches caused by BFS for crew training or testing which cause impacts to mission safety, mission success or scheduled launch date.</p>		Support Flight Software TMR on request	As required
✓	<p>1.4.4.1 ET ELEMENT PROCESSING</p> <p>The contractor shall perform ET processing using hardware and associated documentation certified and furnished by the ET element contractor in support of the operations phase of the STS including the integrated operations as specified in SOW Section 1.5. The contractor shall perform routine, planned/unplanned processing/maintenance operations, test and check out procedures. The contractor shall obtain the ET element contractor's concurrence as necessary to establish an agreement that the integrated operations meet element contractor requirements prior to the scheduled launch.</p>	<p>Approved procedures</p> <p>Engr. Req. Satis (ERS)</p> <p>PMS metric GO-124</p> <p>See entries for paragraphs 1.4 and 1.5.</p>	<p>Review/approve per Insight plan, KPH-010 and SPI s and KPH-1689</p> <p>NASA signature required on ERS as defined per SPI SP-507</p> <p>Reviewed during NASA internal CoFR process per Insight plan KPH-010</p> <p>See entries for paragraphs 1.4 and 1.5.</p>	<p>Continuous</p> <p>Per flow</p> <p>Per flow</p> <p>See entries for paragraphs 1.4 and 1.5.</p>

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TMR Resp	SOW Section	Contractor Performance Evidence	NASA Activity	Frequency of NASA Activity
MI	<p>1.4.4.2 ET LOGISTICS</p> <p>Reference SOW section 1.4 for general logistics requirements.</p> <p>The contractor shall define, assess, and ensure that spare parts and consumables are procured or supplied for the ET and the related support equipment for hardware processing at KSC. The contractor shall obtain from the ET MAF element contractor an agreement on the requirements including total quantity, parts numbers, and consumption or failure rate.</p>		NASA signs Out of Family procedures and any TPS/PR EO-to-follow that are a result of design deficiencies or discrepant hardware.	As needed
✓	<p>1.4.4.4 ET TRANSPORTATION</p> <p>The contractor shall transport the ET by barge from the Michoud Assembly Facility (MAF) to the launch site (KSC). The ET element contractor shall transport the ET and its related equipment from the point of final assembly to the point of barge embarkation and loading to include that effort required to load, tie down and secure the hardware on marine vessels and ballast the barge for sea. The contractor shall schedule all transportation functions and obtain an agreement with the ET element contractor that the ET loaded barge configuration is acceptable for shipment. The contractor shall determine and communicate to the ET element contractor the required number of days prior to the scheduled launch that the ET barge must be loaded and available for shipment. A The contractor shall accomplish marine surveys and shipyard maintenance required to maintain American Bureau of Shipping and U.S. Coast Guard vessel certifications on the two Government Furnished barges identified in attachment J-9C-1 (Government Furnished Property) of this document. The contractor shall make the barges available for other NASA requirements on a</p>			

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TMR Resp	SOW Section	Contractor Performance Evidence	NASA Activity	Frequency of NASA Activity
	non-interference basis with the ET shipments and barge repair schedules.			
GO	<p>1.4.4.5 ET MODIFICATIONS</p> <p>The element contractor shall provide ET modification kits required for ground processing to support the operations phase of the STS. The contractor shall perform operational impact assessments, process requirements, and install, validate and test modification kits. The contractor shall obtain the ET element contractor s concurrence as necessary to establish the correct installation and configuration of ET modifications for each mission.</p>		NASA signs Out of Family procedures that implement new design modifications and any TPS/PR EO-to-follow that are a result of design deficiencies	As needed
MI	<p>1.4.4.7 ET TRANSITION PLAN</p> <p>The contractor shall conduct Phase II transition planning to provide timely, orderly, and effective transfer of responsibility for the MAF as a GOCO facility and MSFC ET contracts. The transition planning shall demonstrate the contractor s technical knowledge and managerial strategy necessary to ensure successful management of the ET production and facilities maintenance. The contractor shall assume responsibility for ET contracts after four successful super lightweight tank flights.</p>		Support appropriate TMR	As required
✓	<p>1.4.5.1 RSRM ELEMENT PROCESSING</p> <p>The contractor shall perform RSRM processing using hardware and associated documentation certified and furnished by the RSRM element contractor. The contractor shall perform all processing activities associated with the RSRM hardware in support of the integrated operations phase of the Shuttle Transportation System as specified in SOW section 1.5. The contractor shall obtain the RSRM element contractor s concurrence as necessary to establish an agreement that the integrated operations meet element</p>	<p>Approved procedures</p> <p>Engr. Req. Satis (ERS)</p> <p>PMS metric</p>	<p>Review/approve per Insight plan, KPH-010 and SPI s and KPH-1689</p> <p>NASA signature required on ERS as defined per SPI SP-507</p> <p>Reviewed during NASA internal</p>	<p>Continuous</p> <p>Per flow</p> <p>Per flow</p>

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TMR Resp	SOW Section	Contractor Performance Evidence	NASA Activity	Frequency of NASA Activity
	contractor requirements prior to the scheduled launch.	GO-124 See entries for paragraphs 1.4 and 1.5.	CoFR process per Insight plan KPH-010 See entries for paragraphs 1.4 and 1.5.	See entries for paragraphs 1.4 and 1.5.
✓	1.4.5.3 RSRM RECOVERY OPERATIONS The contractor shall support integrated operations as identified in SOW section 1.5.4.4.		NASA system engineer is a member on post flight assessment team and review/approve any Out of Family related to hardware anomalies	As needed
GO	1.4.5.5 RSRM MODIFICATIONS The element contractor shall provide RSRM modification kits required for ground processing to support the operations phase of the STS. The contractor shall perform operational impact assessments, process requirements, and install, validate and test modification kits. The contractor shall obtain the RSRM element contractor s concurrence as necessary to establish the correct installation and configuration of RSRM modifications for each mission.		NASA signs Out of Family procedures that implement new design modifications and any TPS/PR EO-to-follow that are a result of design deficiencies	As needed
GO	1.4.5.5 SOW METRIC Required Service: Approved close-out verification from element contractor for each modification/change. Standard: 100% verification within 5 days of completion of modification. MER: 5% late but no incomplete work at ET/SRB mate.		Support appropriate TMR	As required
MI	1.4.5.7 RSRM TRANSITION PLAN			

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TMR Resp	SOW Section	Contractor Performance Evidence	NASA Activity	Frequency of NASA Activity
	The contractor shall conduct Phase II transition planning to provide timely, orderly, and effective transfer of responsibility for the MSFC RSRM contracts. The transition planning shall demonstrate the contractor's technical knowledge and managerial strategy necessary to ensure successful management of RSRM hardware consistent with the maturity of the RSRM design and production process.		Support appropriate TMR	As required
✓	<p>1.4.6.1 SSME ELEMENT PROCESSING</p> <p>The contractor shall perform SSME processing activities at KSC in support of the operations phase of the STS including the integrated operations as specified in SOW section 1.5. The contractor, shall provide managerial, engineering, hands-on and other resources necessary to manage, coordinate, and perform routine, planned/unplanned processing and maintenance operations, test and check out procedures, launch activities, postlanding inspections and processing, transportation, and handling of the SSME S during removal and installation, problem resolution, and implementation of waiver and deviations. The contractor shall obtain the SSME element contractor's concurrence as necessary to establish an agreement that the integrated operations meet element contractor requirements prior to the scheduled launch.</p>	<p>Approved procedures</p> <p>Engr. Req. Satis (ERS)</p> <p>PMS metric GO-123</p> <p>See entries for paragraphs 1.4 and 1.5.</p>	<p>Review/approve per Insight plan, KPH-010 and SPI s and KPH-1689</p> <p>NASA signature required on ERS as defined per SPI SP-507</p> <p>Reviewed during NASA internal CoFR process per Insight plan KPH-010</p> <p>See entries for paragraphs 1.4 and 1.5.</p>	<p>Continuous</p> <p>Per flow</p> <p>Per flow</p> <p>See entries for paragraphs 1.4 and 1.5.</p>
✓	<p>1.4.6.1 SOW METRIC</p> <p>Required Service: Agreement from the element contractor that the baseline configuration has been certified and is ready for launch.</p> <p>Standard: 100% baseline configuration certified prior to integration.</p> <p>MER: 5% late but no incomplete work at integration from baseline configuration.</p>	Engr. Req. Satis (ERS)	NASA signature required on ERS as defined per SPI SP-507 (This is an in-process step prior to installation and does not fully meet the intent of this metric)	Per flow
✓	1.4.6.3 SSME LANDING OPERATIONS			

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Contractor Performance Evidence

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NASA Activity NASA activity used to review or assess contractor performance. Proof must be provided that activity was executed.

Frequency of NASA Activity Frequency required to assess contractor performance (e.g., once per specific flow activity, once per month, etc.).

Ground Operations Surveillance Matrix

Responsible
Organization Key

PH, PH-M1, PH-P, PH-B, OP, TA, Appropriate Org.
PH-M2, PH-F, PH-G, PH-H, PH-J, PH-K

TMR Resp	SOW Section	Contractor Performance Evidence	NASA Activity	Frequency of NASA Activity
	The contractor shall perform the activities associated with landing (i.e. installation of plugs, adapters and locks) and support integrated operations as identified in SOW section 1.5 and SOW section 1.4.6.1.	Approved procedures See entries for paragraph 1.5.4.1	Review/approve per Insight plan, KPH-010 and SPI s and KPH-1689 See entries for paragraph 1.5.4.1	Continuous See entries for paragraph 1.5.4.1
GO	1.4.6.5 SSME MODIFICATIONS The element contractor shall provide SSME modification kits required for ground processing to support the operations phase of the STS. The contractor shall perform operational impact assessments, process requirements, and install, validate and test modification kits. The contractor shall ensure that the SSME element contractor is accountable for the installation/verification of the SSME modification kits and its impact to the final SSME stacked configuration.	Approved procedures	Review/approve per Insight plan, KPH-010 and SPI s and KPH-1689	Continuous
MI	1.4.6.7 SSME TRANSITION PLAN The contractor shall conduct Phase II transition planning to provide timely, orderly, and effective transfer of responsibility for the MSFC SSME contracts. The transition planning shall demonstrate the contractor s technical knowledge and managerial strategy necessary to ensure successful management of the SSME. The contractor shall assume responsibility for the SSME Contracts after delivery of the fifteenth block II engine. The contractor shall also include transition planning for SSME related SSC contracts associated with engineering and hardware assembly in support of the SSME test operations at SSC.		Support appropriate TMR	As required
MI	1.4.9.1 ELEMENT PROCESSING The contractor shall provide launch preparation, and post launch activities related to the overall processing of flight	Approved procedures	Review/approve per Insight plan, KPH-010 and SPI s and	Continuous

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TMR Resp	SOW Section	Contractor Performance Evidence	NASA Activity	Frequency of NASA Activity
	crew equipment required to support the SSP and ISSP programs. The contractor shall maintain, prepare, and supply the individual equipment and provide expendable items in preparation for each mission in accordance with a contractor provided CCCD or SSCCD. This document shall contain reference to data contained in contractor provided camera equipment lists, food menus, clothing lists, and annexes as defined in SOW sections 1.2.2.4 (DR s 1.4.9.1-a, 1.4.9.1-b, 1.4.9.1-c, 1.4.9.1-e, 1.4.9.1-f, and 1.4.9.1-g). The contractor shall provide an Extravehicular Mobility Unit (EMU) flight data report (DR 1.4.9.1). The contractor shall assume responsibility for processing Liquid Cooling Garments (LCG) provided for interface with the Crew Escape Equipment Launch Entry Suits (LES) and Advance Crew Escape Suits (ACES) for Space Shuttle flight and training activities. The contractor shall perform crew ingress/egress for all crew training, Terminal Countdown Demonstration Test (TCDT), launch, and landing activities requiring use of the Crew Escape Equipment (CEE) hardware. The contractor shall provide CEE hardware briefings to various groups, participate in Search and Rescue team simulations requiring use of CEE, and provide technical support to the contractor processing CEE Personal Parachute Assemblies at Ellington Field. The contractor shall provide ISS Food Support for Expedition 2. The contractor shall design, fabricate, test and certify for flight an adapter cable that will convert the Orbiter Direct Current (DC) power connector to interface to the ISS Express Payload Connector. The contractor shall provide maintenance and processing support for ISS Select-A-Dock Chassis.		KPH-1689	
MI	1.4.9.1 SOW METRIC Required Service: Processing and delivery of flight crew equipment.		Support appropriate TMR	As required

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TMR Resp	SOW Section	Contractor Performance Evidence	NASA Activity	Frequency of NASA Activity
	<p>Standard: All crew equipment listed in the CCCD and SSCCD for each flight is provided on time to meet program flight crew training and flight planning milestones.</p> <p>MER: All crew equipment is provided within 2 working days of scheduled facility need dates, but in no case impact safety, mission success, or major program schedule milestones.</p>			
MI	<p>1.4.9.3 TRAINING HARDWARE PROCESSING</p> <p>The contractor shall provide training hardware for on-site and off-site training. The contractor shall ensure training hardware shall support training activities.</p>		Support appropriate TMR	As required
MI	<p>1.4.9.3 SOW METRIC</p> <p>Required Service: Processing, delivery and maintenance of flight crew equipment in support of crew training activities.</p> <p>Standard: All training hardware is properly configured.</p> <p>MER: 1% of the training hardware is improperly configured to support training, but in no case impact safety, mission success or crew training objectives.</p> <p>Standard: All training hardware is provided by negotiated need date.</p> <p>MER: All training hardware is provided within 2 working days of the negotiated need date but in no case impact safety, mission success, or crew training schedules.</p>		Support appropriate TMR	As required

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TMR Resp	SOW Section	Contractor Performance Evidence	NASA Activity	Frequency of NASA Activity
✓	<p>1.5 INTEGRATED LAUNCH & LANDING OPERATIONS</p> <p>The contractor shall control and perform all integrated operations (planned and unplanned) required to ready the SSV, associated facilities and support equipment, for launch and landing activities. The contractor shall conduct all integrated activities in accordance with approved procedures to assure that these systems operate within all design specifications, drawings, and OMRS requirements. Procedures development and maintenance shall be per (DR 1.4-a). The contractor shall support the KSC launch and landing flight preparation plan - KPD 8630.3 and participate in related reviews and forums to assure the proper visibility, progress and launch readiness for ground processing tasks.</p> <p>The contractor shall plan and perform integrated vehicle contingency operations that may arise during integrated processing to support unplanned program contingencies (i.e. hurricanes, launch abort/ turnarounds, etc.) as identified in SOW section 1.1.1.1 and Exhibit 1.1.1.1.</p>	<p>PMS Metric GO-124</p> <p>Engr. Req. Satis (ERS)</p> <p>Contractor reports during flight preparation process per NSTS 08117 appendix R.</p> <p>The Contractor produces the following Contingency Plans which are reviewed and approved by NASA:</p> <ol style="list-style-type: none"> 1. K-STSM-09.3.01 STS Ops Plan Flight & Ground Crew Rescue 2. K-STSM-09.3.02 KSC Shuttle Data Impoundment & Handling Plan 3. KVT-PL-0004 Ops Plan for STS 	<p>Reviewed during NASA internal CoFR process per Insight plan KPH-010 (PE CoFR)</p> <p>Daily insight into integrated operations via NTD console presence. Activity is documented in NTD Logbook.</p> <p>NASA signature required on ERS as defined per SPI SP-507</p> <p>Joint NASA and Contractor participation in Milestone reviews per KPD 8630.3. Attendance roster is maintained by USA.</p>	<p>Per flow</p> <p>Daily</p> <p>Each Milestone per KPD 8630.3.</p> <p>Plans approved for initial submittal and subsequent revisions.</p>

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TMR Resp	SOW Section	Contractor Performance Evidence	NASA Activity	Frequency of NASA Activity
		<p>Emergency Egress System</p> <p>4. KVT-PL-0008 Ops Plan for Post Cryo Loading Pad Access</p> <p>5. S0007 Vol. 5, SSV Launch Countdown Procedure</p> <p>6. S0038 SSV Preparations for Rollback to the VAB</p> <p>7. EPD S9906 EAFB/DFRC Shuttle Landing Site EPD</p> <p>8. EPD S9907 Non-CONUS CLS EPD</p> <p>9. EPD S9925 Shuttle Backup Landing Site EPD (WSSH, NM)</p> <p>10. KVT-PL-0014 KSC Off-site Operations Plan</p> <p>11. KVT-PL-0015 Convoy Operations Plan</p> <p>12. KVT-PL-0021 NSTS Salvage Plan</p> <p>13. KPH-HB-1040.1 PH Emergency Preparedness/</p>		

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Frequency of NASA Activity

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TMR Resp	SOW Section	Contractor Performance Evidence	NASA Activity	Frequency of NASA Activity
	<p>Integrated Orbiter operations begin with the connection of the Orbiter sling assembly to the Orbiter for Orbiter to ET mate operations in the Vehicle Assembly Building (VAB) transfer aisle. Integrated booster operations begin with the SRB aft skirt and RSRM aft segment mate and buildup in the Rotational, Processing and Support Facility (RPSF). Integrated SSME operations begin with engine installation into the Orbiter. Integrated ET operations begin with ET delivery to the VAB. However, stand-alone ET operations in the checkout cell shall be accounted for under SOW section 1.4.4.1. Integrated payload operations begin with payload removal from the payload canister for installation into the Orbiter for horizontal or vertical payload installation and experiment arrival at the OPF/Pad for middeck experiments. The contractor shall support PGOC in Payload operations at KSC.</p> <p>Launch countdown and Orbiter landing/recovery operations at the launch site and planned contingency landing sites, including emergency management at those locations, shall be performed under the management and direction of the NASA Launch, Mission, and Orbiter Landing Recovery Teams. The contractor's organization and personnel shall be fully responsive to the Team's requirements and direction.</p> <p>For purposes of this SOW, integrated landing operations</p>	<p>Hurricane Plan</p> <p>Approved procedures</p>	<p>Review/approve per Insight plan, KPH-010 for NASA Managed Activities and SPI's. These are NASA managed activities performed by a joint NASA and Contractor team with direct management oversight performed by NASA. Results are documented in the S0007 Post-test Debriefing Report by the STD, and the Landing Post-test Debriefing.</p>	<p>Continuous</p> <p>Each Mission</p>

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TMR Resp	SOW Section	Contractor Performance Evidence	NASA Activity	Frequency of NASA Activity
	<p>terminate at Orbiter wheel stop in the OPF at KSC or Mate-Demate Device at DFRC. SSME post launch-integrated operations terminate after engine removal from the Orbiter in the OPF. Payload integrated operations terminate after removal from the Orbiter. RSRM and SRB integrated operations terminate at the completion of preparations for shipment.</p> <p>The contractor shall provide Safety, Mission Assurance and Product Assurance for all integrated hardware and software as defined in SOW section 1.3. The contractor shall refer to SOW section 1.1.1.4 for out-of-family anomaly reporting requirements.</p> <p>The contractor shall report and resolve anomalies in compliance with NSTS 07700 and NSTS 08126 PRACA Requirements, as specified in SOW section 1.3.</p> <p>The contractor shall develop troubleshooting and analysis plans, repair dispositions, and acceptance rationale. The contractor shall perform troubleshooting, analysis, repair, retest, failure analysis, corrective action, trend analysis and follow-up to determine effectiveness of corrective actions. The contractor may perform approved standard repair procedures), repairs which restore hardware to specification, and hardware removal and replacement without explicit government approval of the work documentation when disposition approval is not required in accordance with SOW section 1.1.1.4.</p> <p>The contractor shall ensure all Government and contractor personnel are properly trained or certified, as required, by providing required training or certification before participation in operations or in work areas.</p>	PMS Metric GO-121: Member of Prime Launch Team Certification for Launch		Assess metric once per mission

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Frequency of NASA Activity Frequency required to assess contractor performance (e.g., once per specific flow activity, once per month, etc.).

Ground Operations Surveillance Matrix

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TMR Resp	SOW Section	Contractor Performance Evidence	NASA Activity	Frequency of NASA Activity
✓	<p>1.5 SOW METRIC #1</p> <p>Required Service: Ensure Category 1 OMID procedures are current and available.</p> <p>Standard: 100% of Category 1 procedures on shelf 10 days prior to test start for new procedures, 7 days prior to start for revised procedures, and 3 days prior to start for minor or dash changes to the procedure</p> <p>Expectation: 96% of Category 1 procedures on shelf 10 days prior to test start for new procedures, 7 days prior to start for revised procedures, and 3 days prior to start for minor or dash changes to the procedure.</p> <p>MER: 6% late, but in no case impact safety, mission success, or major program schedule milestones.</p>	PMS Metric A-GO-002, Procedures Are Available to Support Operations	Reviewed by NASA. Metrics are available on line at http://www-ph.ksc.nasa.gov/PerformanceMetrics/metrics.htm .	Quarterly for Award Fee
✓	<p>1.5 SOW METRIC #2</p> <p>Required Service: Meet baselined integrated test schedules.</p> <p>Standard: 100% of all integrated tests are conducted within baselined schedule timelines.</p> <p>Expectation: All integrated tests are conducted within 95% of baselined scheduled timelines.</p> <p>MER: An integrated test may vary 7% from the planned baseline, but in no case impact major program schedule milestones.</p>	PMS Metric A-GO-003: Provide Accurate Integrated Test Schedules	NASA assesses metric following mission completion and evaluates performance as part of Pre-LRR reviews for subsequent mission.	Once per mission
✓	<p>1.5.1 VEHICLE INTEGRATION</p> <p>The contractor shall plan, control and perform all tasks associated with the integration, assembly and testing of an integrated SSV.</p>	See entries for sub-paragraphs 1.5.1.2 and 1.5.1.3 below.	See entries for sub-paragraphs 1.5.1.2 and 1.5.1.3 below.	See entries for sub-paragraphs 1.5.1.2 and 1.5.1.3 below.

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TMR Resp	SOW Section	Contractor Performance Evidence	NASA Activity	Frequency of NASA Activity
✓	1.5.1.1 ELEMENT/CARGO PLANNING & INTEGRATION The contractor shall plan and integrate all element/cargo operations associated with vehicle/payload integration including element readiness reviews, requirement completion status, and open or transferred work assessments. This effort shall also include plans, schedule development, and distribution to the users to support integrated task execution.	PMS Metric GO-123, GO-124 Engr. Req. Satis. (ERS)	Reviewed during NASA internal CoFR process per Insight plan KPH-010 (PE CoFR) NASA signature required on ERS as defined per SPI SP-507	Per flow Per flow
✓	1.5.1.2 PAYLOAD INSTALLATION AND TESTING The contractor shall perform horizontal and vertical payload element installation into the Orbiter, and support the PGOE in payload interface verifications, servicing, and close-out activities (DR 1.5.1.2). This effort shall also include any approved payload optional services related to ground operations.	Approved procedures	Review/approve per Insight plan, KPH-010 for NASA Managed Activities and SPI s	Continuous
✓	1. DPD NO.: 821 ISSUE: BASIC 2. DRD NO.: 1.5.1.2 3. DATA TYPE: 2 4. DATE REVISED: 5. PAGE: 1/1 6. TITLE: Operations and Contamination Control Plan for Integrated Processing at KSC 7. DESCRIPTION/USE: To document the approach to Shuttle/Payload Integrated processing and contamination control at the Orbiter Processing Facilities (OPF's) and Launch Pads. 8. DISTRIBUTION: Per Contracting Officer's letter 9. INITIAL SUBMISSION: Assumption of an on-going requirement; no break in existing submission frequency 10. SUBMISSION FREQUENCY: Annual revisions, as required 11. REMARKS: NAS10-10900, DRL items 040 and 041 12. INTERRELATIONSHIP: SOW 1.5.1.2 13. DATA PREPARATION INFORMATION:			

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TMR Resp	SOW Section	Contractor Performance Evidence	NASA Activity	Frequency of NASA Activity
	<p>13.1 SCOPE: The Operations and Contamination Control Plan for Integrated Processing at KSC develops and defines the contractor's approach to payload element processing during integration activities at the launch pad and the OPF, and to document contamination control processes and responsibilities at these sites.</p> <p>13.2 APPLICABLE DOCUMENTS: K-STSM-14.2.1 <i>KSC Cargo Facility Contamination Control Plan</i> KVT-PL-0024 <i>PCR Payload Operations Plan</i> KSC-PL-0025 <i>Shuttle Facility Contamination Control Implementation Plan</i> NSTS 08242 <i>Space Shuttle Limitations for Non-Flight Materials and Equipment Used In and Around the SSV</i></p> <p>13.3 CONTENTS: The contractor's approach and plan shall be consistent with the scope and content of the applicable documents. The contractor is encouraged to minimize like documentation by consolidating like plans and documentation.</p> <p>13.4 FORMAT: Contractor shall conform to delivery media formats and electronic data formats per DRD 1.1.4.1-e, Data Management Plan, or per Contracting Officer approval.</p> <p>13.5 MAINTENANCE: Changes shall be incorporated by change page or complete reissue (indicate revision level and date).</p>		Review/approve per Insight plan, KPH-010	
✓	<p>1.5.1.3 INTEGRATED TEST EXECUTION</p> <p>The contractor shall perform all processing operations and testing involved in the assembly and servicing of an integrated vehicle. These tasks shall include as a minimum SRB/RSRM stacking operations in the VAB, ET mate to the SRB s, Orbiter to ET mate, SSV transport and mate to the</p>	<p>Approved procedures</p> <p>NASA reviews and approves changes to</p>	<p>Review/approve per Insight plan, KPH-010 and SPI s</p> <p>Daily insight into integrated operations via NTD console</p>	<p>Continuous</p> <p>SPI approval for initial</p>

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TMR Resp	SOW Section	Contractor Performance Evidence	NASA Activity	Frequency of NASA Activity
	launch pad, launch pad interface testing, hypergolic propellant servicing, ordnance installation, Extravehicular Mobility Unit installation/servicing/checkout, and Orbiter aft compartment close-outs. Flight element design support (i.e., Orbiter, SSME, ET, SRB, RSRM, FSW, EVA, and FCE) to integrated testing is covered in SOW section 1.4.	SPI SP-010: Test Team Operational Discipline	presence. Activity is documented in NTD Logbook	submittal and subsequent revisions.
✓	1.5.2 LAUNCH PREPARATIONS The contractor shall perform all launch preparation tasks to determine launch readiness.	See entries in sub-paragraphs 1.5.2.1 through 1.5.2.4 below.	See entries in sub-paragraphs 1.5.2.1 through 1.5.2.4 below.	See entries in sub-paragraphs 1.5.2.1 through 1.5.2.4 below.
✓	1.5.2.1 LAUNCH REQUIREMENTS The contractor shall develop and maintain integrated launch procedures and work authorization documents. The contractor shall maintain and update the mission unique Ground Launch Sequencer (GLS) Configurations document to support launch operations (DR 1.5.2.1).	Approved procedures <i>The Contractor produces the following integrated launch procedures:</i> S0007 Shuttle Countdown S0014 Flight Readiness Firing S0017 Shuttle Terminal Countdown Demonstration Test S0044 Shuttle Final Countdown Phase Simulation S0056 Shuttle Propellant Loading Countdown Simulation S1025 Flight/Ground	Review/approve per Insight plan, KPH-010 for NASA Managed Activities and SPI s <i>NASA reviews and approves the following integrated launch procedures:</i> S0007 Shuttle Countdown S0014 Flight Readiness Firing S0017 Shuttle Terminal Countdown Demonstration Test S0044 Shuttle Final Countdown Phase Simulation S0056 Shuttle Propellant Loading Countdown Simulation S1025 Flight/Ground Crew Egress-Pad	Continuous NASA approval required for each procedure revision.

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TMR Resp	SOW Section	Contractor Performance Evidence	NASA Activity	Frequency of NASA Activity
		Crew Egress-Pad		
✓	<p>1. DPD NO.: 821 ISSUE: BASIC 2. DRD NO.: 1.5.2.1</p> <p>3. DATA TYPE: 1 4. DATE REVISED:</p> <p>5. PAGE: 1/1</p> <p>6. TITLE: KSC Ground Launch Sequencer Configuration Plan</p> <p>7. DESCRIPTION/USE: To define the Ground Launch Sequencer configuration for Launch Countdowns at KSC.</p> <p>8. DISTRIBUTION: Per Contracting Officer's letter</p> <p>9. INITIAL SUBMISSION: Assumption of an on-going requirement; no break in existing submission schedule</p> <p>10. SUBMISSION FREQUENCY: Per mission basis</p> <p>11. REMARKS: NAS10-10900, DRL item 32</p> <p>12. INTERRELATIONSHIP: SOW 1.5.2.1</p> <p>13. DATA PREPARATION INFORMATION:</p> <p>13.1 SCOPE: This plan defines the approach for implementing and monitoring the approved Ground Launch Sequencer configuration.</p> <p>13.2 APPLICABLE DOCUMENTS: NSTS 16007 <i>Launch Commit Criteria and Background</i> KLO-82-0071 <i>GLS Configuration</i></p> <p>13.3 CONTENTS: This plan shall document an approach for implementing and monitoring the approved Ground Launch Sequencer configuration. The scope and content of this plan shall contain as a minimum the KLO-82-0071/GLS Configuration plan.</p> <p>13.4 FORMAT: Contractor shall conform to delivery media formats and electronic data formats per DRD 1.1.4.1-e, Data Management Plan, or per Contracting Officer approval.</p> <p>13.5 MAINTENANCE: Update 14 days prior to launch countdown Call-to-Station.</p>	GLS DRD	Review/approve per Insight plan, KPH-010 and SPI s and KPH-1689	Per flow
✓	1.5.2.2 LAUNCH PLANNING	The contractor	The NASA STD Chairs the	Continuous

TMR Responsibility Key

- ✓ - Full Responsibility
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Contractor Performance Evidence

Data, Reports and/or Metrics generated by the contractor and used by NASA to assess performance (proof of performance required).

NASA Activity NASA activity used to review or assess contractor performance. Proof must be provided that activity was executed.

Frequency of NASA Activity
Frequency required to assess contractor performance (e.g., once per specific flow activity, once per month, etc.).

Ground Operations Surveillance Matrix

Responsible
Organization Key

PH, PH-M1, PH-P, PH-B, OP, TA, Appropriate Org.
PH-M2, PH-F, PH-G, PH-H, PH-J, PH-K

TMR Resp	SOW Section	Contractor Performance Evidence	NASA Activity	Frequency of NASA Activity
	The contractor shall provide work control functions such as launch procedures, plans, and schedule development; and distribution of these items to the users for execution. The contractor shall support the NASA Countdown Working Group (CDWG) efforts to define and resolve specific countdown issues. The contractor shall provide auditable performance metrics development and utilization of approaches to improve problem resolution, ensure schedule adherence, identify, mitigate and control risks; optimize resource utilization, and improve other launch support capabilities.	produces and distributes the required launch planning and execution products, including the Launch Countdown Bar Chart, Launch Countdown Schedules, and the S0007 Launch Countdown procedure.	Launch Countdown Working group and has direct management oversight of activities performed by the joint NASA and Contractor team. Development and distribution of Launch procedures, plans and schedules is a cooperative effort of the LCWG and NASA approval signature is required on the Contractor s final products.	during mission planning
✓	1.5.2.3 LAUNCH TEAM TRAINING The contractor shall train, qualify and certify its launch team for the launch countdown and provide flight crew pad emergency egress training. (The portions of flight crew training related to fire & rescue operations will be provided by the Government.) The contractor s Launch Team Certification Plan shall be approved by NASA (DR 1.5.2.3). These training services and products shall include as a minimum training procedures, training materials, unique training software, tanking and launch simulations, and Terminal Countdown Demonstration Tests (TCDT).	Per SPI s PMS Metric GO-121: Member of Prime Launch Team Certification for Launch	Launch Team Training is a joint NASA and Contractor event, with both contractor and NASA members of the Launch Team being trained. Participation records are maintained by USA for: S0044, S0017. Metric is available on line at http://www-ph.ksc.nasa.gov/PerformanceMetrics/metrics.htm .	Assess metric once per mission.
✓	1. DPD NO.: 821 ISSUE: BASIC 2. DRD NO.: 1.5.2.3 3. DATA TYPE: 1 4. DATE REVISED: 5. PAGE: 1/1 6. TITLE: KSC Launch Team Certification Plan 7. DESCRIPTION/USE: To document the training, qualification and certification process for the KSC Launch Control Team.	Contractor produces DR 1.5.2.3: KSC Launch Team Certification Plan. It is	Reviewed by Chief Engineer NASA reviews and approves the Launch Team Certification Plan and participates in the training.	Per flow Plan approved for initial submittal and subsequent

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PH-M2, PH-F, PH-G, PH-H, PH-J, PH-K

TMR Resp	SOW Section	Contractor Performance Evidence	NASA Activity	Frequency of NASA Activity
	8. DISTRIBUTION: Per Contracting Officer's letter 9. INITIAL SUBMISSION: First complete mission flow by contractor 10. SUBMISSION FREQUENCY: Annual revisions as required. 11. REMARKS: 12. INTERRELATIONSHIP: SOW 1.5.2.3 13. DATA PREPARATION INFORMATION: 13.1 SCOPE: The KSC Launch Team Certification Plan documents, at a minimum, the launch team certification process for Countdown Call-to-Stations through Launch or scrub turnaround safing. 13.2 APPLICABLE DOCUMENTS: None 13.3 CONTENTS: The plan shall document a standardized approach for training the combined contractor/Government launch team for conducting launch operations, providing flight crew pad emergency egress training, and certifying that the contractor's engineers and operations managers are fully qualified for conducting a launch countdown. The plan shall encompass individual proficiency for each respective discipline as well as in the launch process itself. Training plans shall include as a minimum launch countdown simulations, active participation in integrated testing activities, tanking simulations, detailed training on the operation and maintenance of flight hardware, software, and support equipment; and requirements, procedures, and related requirements and processes. 13.4 FORMAT: Contractor format is acceptable with NASA approval. 13.5 MAINTENANCE: Changes shall be incorporated by change pages or complete revision.	reviewed and approved by NASA.		revisions.
✓	1.5.2.4 LAUNCH READINESS			

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TMR Resp	SOW Section	Contractor Performance Evidence	NASA Activity	Frequency of NASA Activity
	The contractor shall develop and implement an auditable approach to verify and ensure contractor launch and landing readiness with all requirements met and all problems dispositioned. This approach shall include, as a minimum, open item reviews, pre-test briefings, facility/equipment/flight element readiness walkdowns, closed loop tracking, verification and satisfaction of configuration, OMRS and PVIS/ACOMC requirements.	<p>Engr. Req. Satis. (ERS)</p> <p>Contractor reports during flight preparation process per NSTS 08117 appendix R.</p>	<p>NASA signature required on ERS as defined per SPI SP-507</p> <p>Joint NASA and Contractor participation in Milestone reviews per KPD 8630.3. Attendance roster is maintained by USA.</p> <p>Pre-LRR reviews are conducted with Shuttle Project Office and Contractor counterparts. Briefing material and attendees maintained by SPO Chief.</p> <p>STD conducts the Joint NASA and Contractor Team S0007 Pre-test Briefing. Meeting minutes are maintained.</p> <p>NASA team member from NTD Office participates in final facility/pad/equipment/flight element walkdown conducted as part of S0007. FOD discrepancies noted in Appendix K are collected and tracked in metric CP6-016: FOD Discrepancies by Mission.</p>	<p>Per flow</p> <p>Each Milestone per KPD 8630.3.</p> <p>Once per mission (minimum)</p> <p>Once per mission (minimum)</p> <p>Once per mission (minimum)</p>
✓	<p>1.5.2.4 SOW METRIC</p> <p>Required Service: All work items identified on the initial Launch Countdown constraints list either</p>	PMS Metric A-GO-004: USA is Ready to Start Launch Countdown	NASA assesses metric following mission completion and evaluates performance as part	Once per mission

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TMR Resp	SOW Section	Contractor Performance Evidence	NASA Activity	Frequency of NASA Activity
	<p>Standard: completed, closed or scheduled to be worked. 100% of all items on the initial Launch Countdown constraints list completed and closed prior to Launch Countdown Call-to-Stations. (Except work items that must be either performed during the countdown due to technical constraints or are in the final documentation closure process.)</p> <p>Expectation: 97% of all items on the initial Launch countdown constraints list completed and closed prior to Launch Countdown Call-to-Stations. (Except work items that must be either performed during the countdown due to technical constraints or are in the final documentation closure process.).</p> <p>MER: 3% of items open until start of ET tanking, but in no case any work open that impacts the remainder of launch countdown or safety.</p>		of Pre-LRR reviews for subsequent mission.	
✓	<p>1.5.3 LAUNCH EXECUTION</p> <p>The contractor shall perform launch countdown activities and initial pad safing and securing operations.</p>		See Subsections Below	
✓	1.5.3.1 RESERVED			
✓	<p>1.5.3.2 LAUNCH OPERATIONS</p> <p>The contractor shall assemble, qualify and certify its launch control team to provide overall assessment and execution of launch countdown activities, contractor launch team performance, problem resolution and launch requirement satisfaction under the direction and management of the NASA launch team. The contractor s organization and personnel shall be fully responsive to the team s</p>	<p>The Contractor produces the plans and procedures used during launch countdown execution. The Contractor s assembled team</p>	<p>These are NASA managed activities performed by a joint NASA and Contractor team with direct management oversight performed by NASA. Results are documented in the S0007 Post test Debriefing Report by</p>	Each mission.

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TMR Resp	SOW Section	Contractor Performance Evidence	NASA Activity	Frequency of NASA Activity
	<p>requirements and direction. The final responsibility for launch commitment will continue as a NASA function.</p> <p>The contractor shall perform activities required to ensure and verify final launch readiness, requirement satisfaction, and problem resolution; complete remaining vehicle/payload/ISS/pad close-out activities, support PGOC in Payload/ISS/pad/close-out activities, and conduct launch countdown with a certified and qualified launch control team. Launch countdown activities shall include as a minimum integrated propulsion system integrity verification, final facility/pad/equipment/flight element walkdowns, reactant servicing, Rotating Service Structure (RSS) securing, late access/conditioned cargo installation activities, flight crew equipment stowage, flight crew support, ET loading, flight crew ingress and cabin close-out, terminal count, launch and initial pad safing/securing in accordance with the OMRS and LCC requirements. Flight element design support to integrated launch operations is covered in SOW section 1.4.</p>	<p>members execute launch countdown under the direction of NASA.</p> <p>Engr. Req. Satis. (ERS)</p> <p>PMS Metrics GO-123, GO-124, A-GO-001</p> <p>Shuttle Engr. Directive (SED) T-55</p> <p>Approved procedures</p>	<p>the STD, and the Landing Post-test Debriefing Report .</p> <p>NASA signature required on ERS as defined per SPI SP-507</p> <p>Reviewed during NASA internal CoFR process per Insight plan KPH-010 (PE CoFR)</p> <p>NASA team member from NTD Office participates in final facility/pad/equipment/flight element walkdown conducted as part of S0007. FOD discrepancies noted in Appendix K are collected and tracked in metric CP6-016: FOD Discrepancies by Mission.</p>	<p>Per flow</p> <p>Per flow</p> <p>Per flow</p> <p>Continuous</p> <p>Once per mission</p>
✓	<p>1.5.4 POST LAUNCH</p> <p>The contractor shall provide an integrated landing support capability, provide KSC and DFRC contingency mission</p>	Approved procedures	Review/approve per Insight plan, KPH-010 for NASA	Continuous

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Frequency of NASA Activity Frequency required to assess contractor performance (e.g., once per specific flow activity, once per month, etc.).

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TMR Resp	SOW Section	Contractor Performance Evidence	NASA Activity	Frequency of NASA Activity
	support, transatlantic abort site support, payload/ISS element removal efforts, and SRB recovery and disassembly operations. This effort shall be performed under the direction and management of the NASA Mission and Orbiter Landing/Recovery Teams.	See Paragraph DRD 1.5.4.1	Managed Activities and SPI s These are NASA managed activities performed by a joint NASA and Contractor team with direct management oversight performed by NASA. Results are documented in the Landing Post- test Debriefing Report.	Each Mission
✓	1.5.4.1 INTEGRATED LANDING OPERATIONS The contractor shall perform planned and unplanned Orbiter landing operations, including site readiness preparations and post-landing operations at the Primary Landing Site, Secondary Landing Site, Contingency Landing Site locations, and Transatlantic Abort Landing sites under the direction and management of the NASA landing team. This effort shall include the integration of efforts to recover and tow the Orbiter to either the Orbiter Processing Facility or the DFRC Mate-Demate Device; payload element destow/early access operations; Return to Launch Site (RTLS) convoy support; and, transportation of equipment, material, rentals, and freight to these sites. Orbiter and SSME element standalone recovery operations and preparations for ferry flight are covered in SOW section 1.4. Integrated landing operations shall be conducted (DR 1.5.4.1).	Approved procedures See Paragraph DRD 1.5.4.1	Review/approve per Insight plan, KPH-010 for NASA Managed Activities and SPI s These are NASA managed activities performed by a joint NASA and Contractor team with direct management oversight performed by NASA. Results are documented in the Landing Post- test Debriefing Report.	Per flow Each mission.
✓	1. DPD NO.: 821 ISSUE: BASIC 2. DRD NO.: 1.5.4.1 3. DATA TYPE: 2 4. DATE REVISED: 5. PAGE: 1/1 6. TITLE: Post Launch Operation Plan 7. DESCRIPTION/USE: To document processes, products and responsibilities for supporting landing and recovery operations at secondary and contingency landing sites. 8. DISTRIBUTION: Per Contracting Officer's letter	The Contractor produces DRD 1.5.4.1 Post Launch Operation Plan which includes the following: 1. SFOC-GO0021: Off-site Operations Plan		

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TMR Resp	SOW Section	Contractor Performance Evidence	NASA Activity	Frequency of NASA Activity
	<p>9. INITIAL SUBMISSION: Assumption of an on-going requirement; no break in existing submission schedule</p> <p>10. SUBMISSION FREQUENCY: N/A</p> <p>11. REMARKS: NAS10-10900, DRL items 030 and 044</p> <p>12. INTERRELATIONSHIP: SOW 1.5.4.1</p> <p>13. DATA PREPARATION INFORMATION:</p> <p>13.1 SCOPE: The Post Launch Operation Plan defines contractor's responsibilities and implementation procedures for off-site landings, convoy operations, and Orbiter salvage operations.</p> <p>13.2 APPLICABLE DOCUMENTS</p> <p>SFOC-GO0021 KSC Off-site Operations Plan</p> <p>SFOC-GO0014 KSC NSTS Salvage Plan</p> <p>SFOC-GO0022 Convoy Operations Plan</p> <p>13.3 CONTENTS: The contractor shall develop and maintain (update) a plan that covers support for an Orbiter landing and recovery at secondary or contingency landing site, convoy operations and KSC support for Orbiter salvage operations. These plans shall encompass the scope and content of the applicable KSC documents in 13.2.</p> <p>13.4 FORMAT: Contractor shall conform to delivery media formats and electronic data formats per DRD 1.1.4.1-e, Data Management Plan, or per Contracting Officer approval.</p> <p>13.5 MAINTENANCE: Changes shall be incorporated as required by change page or complete reissue.</p>	<p>2. S3005: Support Transfer of Equipment form KSC/DFRC to ELS</p> <p>3. S5044: Post Landing Deservicing/Mate to SCA CLS</p> <p>NASA has review and approval authority for these documents.</p>		
✓	<p>1.5.4.2 MISSION SUPPORT</p> <p>The contractor shall provide integrated Orbiter landing support for unplanned, early mission termination at the primary and secondary landing sites. Convoy support at DFRC and White Sands Space Harbor consists of initial Orbiter safing, flight crew egress and towing the Orbiter to the Mate-Demate Device/Orbiter Deserving Area. Orbiter, SSME and other element mission support is covered under SOW section 1.4. The contractor shall also provide contingency mission control center support via the Launch</p>	<p>Approved procedures</p> <p>See Paragraph DRD 1.5.4.1 and Landing Contingency Plans listed in Paragraph 1.5.</p>	<p>Review/approve per Insight plan, KPH-010 for NASA Managed Activities and SPI s</p> <p>These are NASA managed activities performed by a joint NASA and Contractor team with direct management oversight performed by NASA. Results</p>	<p>Continuous</p> <p>Each mission.</p>

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Contractor Performance Evidence

Data, Reports and/or Metrics generated by the contractor and used by NASA to assess performance (proof of performance required).

NASA Activity NASA activity used to review or assess contractor performance. Proof must be provided that activity was executed.

Frequency of NASA Activity Frequency required to assess contractor performance (e.g., once per specific flow activity, once per month, etc.).

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TMR Resp	SOW Section	Contractor Performance Evidence	NASA Activity	Frequency of NASA Activity
	Processing System (LPS) in the KSC Launch Control Center and operational communications support as specified in SSP Emergency Mission Control Center Activation s and Operations Procedures (534-CAP-EMCC) and SOW section 1.1.1.1.		are documented in the Landing Post- test Debriefing Report.	
✓	1.5.4.3 PAYLOAD ELEMENT REMOVAL The contractor shall perform payload/middeck experiment/pallet/module/ISS element removal operations from the Orbiter.	Approved procedures	Review/approve per Insight plan, KPH-010 for NASA Managed Activities and SPI s	Per flow
✓	1.5.4.4 SOLID ROCKET BOOSTER & REUSABLE SOLID ROCKET MOTOR RECOVERY & DISASSEMBLY The contractor shall recover and retrieve the spent boosters, parachutes and frustums from the Atlantic Ocean and transport them to the CCAS Hanger AF. The contractor shall safe and disassemble the hardware, conduct post-flight inspections, document anomalies and prepare the hardware for shipment off-site and deliver parachute assemblies on-site for processing.		NASA system engineer is a member on post flight assessment team and review/approve any Out of Family related to hardware anomalies	As needed

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TMR Resp	SOW Section	Contractor Performance Evidence	NASA Activity	Frequency of NASA Activity
GO	<p>1.5.5 SYSTEMS, FACILITIES AND EQUIPMENT</p> <p>The contractor shall manage, operate, maintain and provide sustaining engineering and logistics for the systems, facilities, and equipment, delineated in Attachment J-9 Sections A, B, and D, including applicable software/firmware which includes multiple categories of KSC ground application software. Systems, facilities and equipment will be transitioned to the contractor in accordance with Attachment J-9.</p> <p>The contractor shall review site support, make/buy decisions and services and aggressively pursue subcontracting and outsourcing opportunities. The contractor should be innovative in effectively using the marketplace and challenge the current paradigm of keeping the work in house. The ultimate goal is to have safe, cost effective site support and services while balancing reliability and risk.</p>		Review/approve per Insight plan, KPH-010 and SPI s and KPH-1689	Continuous
✓	<p>1.5.5.1 OPERATIONS</p> <p>The contractor shall develop, plan, schedule and perform all systems, facilities, and equipment operations required in the performance of this contract. The contractor shall provide operational services to NASA and other KSC users, for the contractor assigned systems, such as data, voice, video, complex control systems, and the Hypergol Maintenance Facility (HMF) Deluge Pump House which interface with systems assigned to others. The contractor shall provide operators for all equipment maintained by others and used by the contractor, such as life support. Training and certification of contractor operators for life support will be provided by the Government. The contractor operators of critical cranes shall comply with NSS-GO-1740.9.</p> <p>The contractor shall provide all support to contractor</p>	<p>Approved procedures</p> <p>The contractor maintains operating and maintenance OMI and SPIs to assure compliance</p>	<p>Review/approve per Insight plan, KPH-010 and SPI s and KPH-1689</p> <p>NASA S&MA inspects each critical lift crane yearly and reviews the OMI and SPIs as issue arise</p>	<p>Continuous</p> <p>yearly</p>

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NASA Activity NASA activity used to review or assess contractor performance. Proof must be provided that activity was executed.

Frequency of NASA Activity Frequency required to assess contractor performance (e.g., once per specific flow activity, once per month, etc.).

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TMR Resp	SOW Section	Contractor Performance Evidence	NASA Activity	Frequency of NASA Activity
	<p>operations at KSC and the Contingency Landing Sites, except support furnished by the Government as described in Attachment J-10. Support provided by the contractor includes operational laboratories (NDE except radiography, Calibration (except standards), Sampling and Analysis and Component Cleaning/Refurbishment) and janitorial, and Non-Productive supply in contractor operational/technical areas.</p> <p>The contractor shall be responsible for the software utilized to support checkout and processing of flight elements and mission unique application software development. This software executes on the appropriate systems identified in SOW section 1.5.5 and Attachment J-9.</p> <p>Exhibit 1.5.5.1-B identifies the SPDMS and IWCS applications. The contractor shall continue to refine and enhance these key capabilities as appropriate or propose alternative concepts/approaches to integrated work control management.</p> <p>The contractor shall support the development of the Integrated Data System (IDS) to incorporate the functionality of various operational data acquisition, control, record, and monitor systems (i.e., CCMS, CDS, RPS, PMS, etc.) into an integral open architecture data system consisting primarily of COTS equipment supported by a minimum of custom hardware/software. The contractor shall provide development support in accordance with SOW section 1.7.1.</p>			
✓	<p>1.5.5.1 SOW METRIC</p> <p>Required Service: Provide operational services scheduled on Kennedy Integrated Control Schedules, Payload Integrated Control Schedules or system outages to NASA and other KSC</p>	PMS metric A-GO-005, Provide Operational Services to Non-SFOC Users	NASA Communications organization partnering with contractor on content.	Quarterly

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NASA Activity NASA activity used to review or assess contractor performance. Proof must be provided that activity was executed.

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Frequency of NASA Activity Frequency required to assess contractor performance (e.g., once per specific flow activity, once per month, etc.).

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TMR Resp	SOW Section	Contractor Performance Evidence	NASA Activity	Frequency of NASA Activity
	<p>Standard: users for contractor assigned systems which interface with others. 100% of user requests met by due date negotiated between the contractor and the requester.</p> <p>Expectation: 95% of user requests met by due date negotiated between the contractor and the requester.</p> <p>MER: 10% late, with all requests met within 30 days of due date, but in no case impact major program schedule milestones.</p>			
GO	<p>1.5.5.2 MAINTENANCE</p> <p>The contractor shall implement a comprehensive proactive maintenance program incorporating reliability centered maintenance in accordance with NHB 8831.2 for assigned facilities and facility systems. The level of maintenance provided shall assure the reliability, cost effectiveness, and serviceability and longevity of the assigned systems and equipment. The contractor shall, as a minimum, assure the systems, facilities, and equipment are maintained in a condition which assures reliability and prevents degradation. The contractor shall maintain all applicable software/firmware for the assigned systems, facilities, and equipment. In addition to maintaining the systems and equipment as delineated in Attachment J-9, the contractor shall maintain and support flight and flight-type equipment assigned to ground support equipment, simulators, and off-line laboratories. The contractor shall submit a maintenance plan (DR 1.5.5.2).</p>	<ul style="list-style-type: none"> ■ Contractors Annual Maintenance Plan is released on web. ■ Quarterly updates of required data provided on Web. ■ Partnering DRD changes. ■ RCM training activities. 	<p>Review/approve per Insight plan, KPH-010 and SPI s and KPH-1689 and</p> <p><u>1.5.5.2 Facilities Maintenance Plan</u></p> <ul style="list-style-type: none"> ■ Review Maintenance Plan submittal. ■ Review budget cost trends (plan vs. actual by facility) required by Maintenance Plan ■ Partner DRD changes w/ Program ■ Review quarterly trend data. ■ Perform field surveillance and documentation audits . ■ Submit findings into PITA. 	<ul style="list-style-type: none"> ■ Annual Plan Review. ■ Quarterly trending. ■ COFR each flow ■ Award Fee

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Frequency of NASA Activity Frequency required to assess contractor performance (e.g., once per specific flow activity, once per month, etc.).

Ground Operations Surveillance Matrix

Responsible
Organization Key

PH, PH-M1, PH-P, PH-B, OP, TA, Appropriate Org.
PH-M2, PH-F, PH-G, PH-H, PH-J, PH-K

TMR Resp	SOW Section	Contractor Performance Evidence	NASA Activity	Frequency of NASA Activity
GO	<p>1.5.5.2 SOW METRIC</p> <p>Required Service: Maintain systems, software, firmware, facilities, and equipment</p> <p>Standard: Perform 100% of all planned maintenance tasks delineated in the yearly maintenance plan (DR 1.5.5.2.)</p> <p>Expectation: 90% of all maintenance tasks delineated in the yearly maintenance plan (DR 1.5.5.2) completed.</p> <p>MER: 15% of tasks not completed (85% completed), but in no case impact safety, mission success or major program schedule milestones.</p>	<ul style="list-style-type: none"> ■ PMS metric A-GO-006, Maintain Systems, Software, Firmware, Facilities and Equipment. 	<ul style="list-style-type: none"> ■ Perform assessment of contractor's PMS data. ■ Data at organizational level is assessed. ■ Partner improvements to PMS data charts. 	<ul style="list-style-type: none"> ■ Award Fee ■ Each Flow COFR
GO	<p>1.5.5.3 SUSTAINING ENGINEERING</p> <p>The contractor shall provide systems, facilities and equipment hardware/software/firmware sustaining engineering that meets the original design intent (i.e. form, fit and function). The contractor shall develop the applicable sustaining engineering documentation, implement the appropriate modifications, and maintain this documentation current in accordance with SOW section 1.1.5.1. The contractor shall list all planned hardware and software modifications to configured systems (DR 1.5.5.3). The contractor shall comply with NHB 8820.2.</p>	Approved procedures	Review/approve per Insight plan, KPH-010 and SPI s and KPH-1689	Continuous
GO	<p>1.5.5.3 SOW METRIC #1</p> <p>Required Service: Document changes to configured facilities, systems and equipment.</p> <p>Standard: 100% of all contractor generated changes documented prior to implementation need.</p> <p>Expectation: 98% of all contractor-generated changes to facilities, systems and equipment</p>	<ul style="list-style-type: none"> ■ PMS Maintenance metrics for ground systems, A-GO-007, Document contractor generated changes 	<ul style="list-style-type: none"> ■ Perform assessment of contractor's PMS data. ■ Data at organizational level is assessed. ■ Partnering improvements to PMS data charts. ■ PITA on contractors 	<ul style="list-style-type: none"> ■ Award Fee

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Contractor Performance Evidence

Data, Reports and/or Metrics generated by the contractor and used by NASA to assess performance (proof of performance required).

NASA Activity NASA activity used to review or assess contractor performance. Proof must be provided that activity was executed.

Frequency of NASA Activity Frequency required to assess contractor performance (e.g., once per specific flow activity, once per month, etc.).

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TMR Resp	SOW Section	Contractor Performance Evidence	NASA Activity	Frequency of NASA Activity
	MER: documented prior to implementation need. 5% backlog (of contractor-generated changes) to facilities, systems and equipment late, but in no case impact safety or delay critical milestones.		performance being developed. ■ Partnering improvements of existing data being provided.	
GO	1.5.5.3 SOW METRIC #2 Required Service: Document changes to CCMS system/applications software/firmware. Standard: 100% of all contractor generated CCMS system/applications software/firmware changes documented prior to software production. Expectation: 98% of all pre-planned contractor-generated CCMS system/applications software/firmware changes documented prior to implementation need. MER: 5% backlog (of configured products which document generated changes) to software/firmware, but in no case impact specific user need.	PMS metric A-GO-010, Document CCMS Changes to Configured Facilities, System and Equipment	Metric reviewed by PH-K and available on line at http://www-ph.ksc.nasa.gov/PerformanceMetrics/metrics.htm .	Quarterly
GO	1.5.5.3 SOW METRIC #3 Required Service: Configuration engineering documentation for facilities, systems and equipment is released complete and with minimal errors. Standard: 100% of contractor changes to facilities, systems and equipment requires no documentation correction or production re-releases. Expectation: 95% of contractor changes to facilities, systems and equipment requires no documentation correction or production	■ PMS Maintenance metrics for ground systems, A-GO-009, Configuration Engineering Documentation & S/W Code Released with Minimal Errors	■ Perform assessment of contractor's PMS data. ■ Data at organizational level is assessed. ■ Partnering improvements to PMS data charts. ■ PITA on contractors performance being developed. ■ Partnering improvements of existing data being provided.	■ Quarterly

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NASA Activity

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Frequency of NASA Activity

Frequency required to assess contractor performance (e.g., once per specific flow activity, once per month, etc.).

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TMR Resp	SOW Section	Contractor Performance Evidence	NASA Activity	Frequency of NASA Activity
	<p>MER: re-releases. No more than 10% of contractor changes to facilities, systems and equipment requires correction to released documentation or production re-releases.</p>			
GO	<p>1.5.5.3 SOW METRIC #4</p> <p>Required Service: Configuration engineering documentation and code for CCMS system/applications software is released complete and with minimal errors.</p> <p>Standard: 100% of contractor changes to CCMS system/applications software requires no documentation correction or immediate production code re-releases as a result of coding errors.</p> <p>Expectation: 98% of CCMS system/applications software changes requires no correction to released documentation or immediate production code re-releases as a result of coding errors.</p> <p>MER: 95% of CCMS system/applications software changes requires no correction to released documentation or immediate production code re-releases as a result of coding errors.</p>	<p>PMS metric A-GO-008, Configuration Engineering Documentation & S/W Code Released with Minimal Errors</p>	<p>Metric assessed by PH-K and available on line at http://www-ph.ksc.nasa.gov/PerformanceMetrics/metrics.htm.</p>	<p>Quarterly</p>
✓	<p>1. DPD NO.: 821 ISSUE: BASIC 2. DRD NO.: 1.5.5.3 3. DATA TYPE: 3 4. DATE REVISED: 5. PAGE: 1/1 6. TITLE: Notification of Modifications to KSC Configured Systems and Equipment Report 7. DESCRIPTION/USE: To notify the Government of contractor planned and/or initiated modifications to KSC configured systems, facilities, and equipment, including</p>	<p>Convene Configuration Control Board (CCB) & produce Directives and Minutes</p>	<p>Review copies of CCB Directives</p>	<p>As required</p>

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TMR Resp	SOW Section	Contractor Performance Evidence	NASA Activity	Frequency of NASA Activity
	<p>hardware, software, and operating procedures.</p> <p>8. DISTRIBUTION: Per Contracting Officer's letter</p> <p>9. INITIAL SUBMISSION: Assumption of an on-going requirement; no break in existing submission schedule</p> <p>10. SUBMISSION FREQUENCY: Within 7 days of project/change approval by the contractor, but in all cases prior to implementation.</p> <p>11. REMARKS: NAS10-10900, DRL item 024</p> <p>12. INTERRELATIONSHIP: SOW 1.5.5.3</p> <p>13. DATA PREPARATION INFORMATION:</p> <p>13.1 SCOPE: This report provides notification to the Government of modifications to KSC configured systems, facilities, and equipment.</p> <p>13.2 APPLICABLE DOCUMENTS: KSC Drawing 79K09579, Rev. R, identifies the configured systems and equipment.</p> <p>13.3 CONTENTS: This report shall describe the modification of the hardware, software, and/or operating procedures for the configured systems and equipment, and provide the justification for making the change.</p> <p>13.4 FORMAT: Contractor shall conform to delivery media formats and electronic data formats per DRD 1.1.4.1-e, Data Management Plan, or per Contracting Officer approval.</p> <p>13.5 MAINTENANCE: As required.</p>			

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TMR Resp	SOW Section	Contractor Performance Evidence	NASA Activity	Frequency of NASA Activity
✓	1.7.1.1 KSC SHUTTLE DEVELOPMENT ACTIVITIES The contractor shall participate, as required, in Government initiated SSP program special studies and development projects.	Quarterly Review data, Two-minute charts, and POP Submit data. Data maintained on Shuttle and Station PMO server and as hardcopies with Shuttle and Station PMO. Monthly Operating Plan for Launch and Landing Projects PMR Status Report (pink book)	Monthly and Quarterly reviews of project data highlights with Shuttle and Station PMO. Quarterly Reviews with Shuttle Processing Directorate Management, Annual POP review with KSC and Shuttle Program management	Monthly and Quarterly reviews. Year-end close-out reviews.
✓	1.7.1.2 KSC CONSTRUCTION OF FACILITIES (CofF) ACTIVITIES The contractor shall participate, as required, in Government initiated CofF special studies and development projects.	Facility Quarterly Management Review Quarterly Management Project Review	Support Facility Quarterly Management Review as active member and provide input to Program Integration TMR Support Quarterly Management Project Review as active member and provide input to Program Integration TMR	Quarterly Quarterly

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KSC SFOC Ground Operations Surveillance Matrix (DRAFT)

6/22/2000